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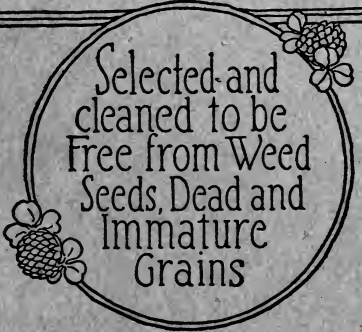
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SCOTT'S

FIELD SEEDS

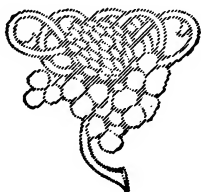


Selected and
cleaned to be
Free from Weed
Seeds, Dead and
Immature
Grains

O. M. SCOTT & SONS CO.
MARYSVILLE, OHIO.



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FOREWORD



HIS seed book is unlike others in that it deals with field seeds only. Its contents are devoted to information of interest and real value to the sower of field seeds. If you have had difficulty in finding the kind that you know should be sown on your ground, a few minutes devoted to the following pages will not be lost. That the book is worth while is attested by the many letters which we receive.

We give excerpts from a few.

"I received a copy of 'Scott's Field Seeds' recently and consider it the very best seed catalog I have ever seen. One of our Farm Bureau members came into the office and saw it and would like to have one. I would appreciate it very much if I could have a dozen to distribute.

"Please do us the favor to send us your booklet 'Scott's Field Seeds.' The Iowa State College has made reference to this pamphlet very favorably.

"Have just put in a few minutes studying the most convincing little farm seed catalog I have ever seen. I might mention that it is the one you mailed me a few weeks ago.

"I received your good catalog. It is a relief to receive one with the gaudy colors omitted and some reading matter worth while in place of them."

If in reading this book you are convinced that pure seed can be obtained and that the number of weeds already on your farm can be reduced, you may wish to favor a neighbor who is anxious to increase yields. Give him this copy and we will be glad to send you another.



GRICULTURE is the art of compelling the soil to produce,—not what it would grow,—but what we would have it grow. Weeds are the hardiest and most aggressive plants, traveling by land, by water, and in the air, over the whole earth. They are enemies that must be overcome if agriculture is to succeed.

Nearly all governments have prepared books and pamphlets describing and illustrating the various weeds and urging the use of accepted methods of control and riddance. All of our State Experiment Stations issue bulletins showing the danger from weeds. Recognizing the losses that come from sowing weedy seed nearly all states have enacted pure seed laws. In this book we give computations of some of these losses and show the damage we do ourselves by sowing weedy and non-germinating field seeds. This information will be of particular interest to the man, who, last year, sowed thirty-dollar clover seed, only to find that instead of a thick-set field of beautiful clover he had a field of unsightly and unprofitable weeds.

More than ever field seeds must be selected with a clear sense of the weed danger and with the knowledge that fields must now produce more; because farm values have increased greatly while the price of farm products shows a distinct tendency downward.

The high prices now ruling will tempt many to buy cheap or mixed seed. Further along we explain why the use of such seed, when judged by results, is a costly error of judgment.

This year there is special need for our book, not only because seeds are higher than ever before, but because many varieties are of poorer quality than usual. Almost invariably small yields of grass and clover mean that weeds are abundant and that their seeds plentifully contaminate the seed harvest. As stated on page 10 many weed seeds cannot be removed in cleaning. You should, therefore, be able to recognize them yourself and so avoid using seed containing them. No pure seed law can protect you against noxious weeds as effectually as the ability to detect them and judge for yourself the quantity contained in a bushel.

An enormous quantity of red clover is being imported from Italy. The Department of Agriculture says that this clover in

no way equals native seed. It is more subject to clover diseases, much more likely to winter-kill and makes a smaller growth. Under Red Clover we explain how you can identify Italian seed.

Greatest losses come to the farmer from sowing mixed seed. In the section "How to Know Good Seed" you will find the means of telling whether alsike and timothy mixtures are money-savers or money-losers and whether or not you want to sow seed that was "accidentally" mixed in the wareroom.

It is unnecessary for you to take anything for granted. You can easily find out for yourself which of several lots of seed is the safest and most economical to sow. Sometimes seed is not all that it is claimed to be. For reasons explained on page 12 there can be no such thing as a seed bargain, at least from the farmer's standpoint.

Seed is high this year because of the small production. At the time this is written we can see nothing but still higher prices. But the thing that most concerns the farmer is not to seed as cheaply as possible but to use good seed, which costs least in the long run. Paying for only one pound of waste matter in a bushel amounts to a considerable loss, but when it is considered that three or four pounds of dead grains to a bushel of clover seed are inconspicuous and likely to escape notice without our test and that the same amount of weed seeds may be easily overlooked, it is evident that quality demands first consideration. Very few farmers send clover or grass seed to an experiment station for analysis. For that reason we urge more strongly each year the use of the method of testing described in the short paragraph on page 13. A few minutes only need be spent in testing the seed from which you expect to reap the crop that is the object of your labors. This simple, easy precaution will add greatly to the likelihood of your getting the profit to which you are entitled. You need not be an expert to know good seed.

No matter what seed you have used we invite closest comparison.

At experiment stations (where careful records are kept), Scott's Seeds have in a large majority of cases proved to be the most economical.

Why We Do One Thing

BEFORE developing a national market for our field seeds, we sold seeds in a retail store for more than thirty years. We learned that we could not afford to purchase garden and flower seeds from the concern that handled field seeds also, and that owing to the narrow margin on which field seeds were sold, we could buy them profitably from no one but the seedsman who dealt in nothing else.

Too often had service as well as quality proved a disappointment when dealing with seedsmen who tried to sell all kinds of seeds.

We wished to occupy a new position in the seed trade, to have some outstanding distinction, and from our own efforts to find seeds free from weed seeds and dead grains we learned that there is a place for the seedsman who will give all his time and endeavors to the marketing of pure field seeds.

We knew that in order to introduce our seeds quickly we must get away from the old idea of trying to supply ALL seeds; we must adopt the new idea of specializing, for only by this restriction of aim could we hope to furnish the sort of field seeds that people want,—seed free from weed seeds and dead grains,—and at the same time provide satisfactory service.

Thanks to the immediate support our policy received we believe that we are giving the users of Scott's Seeds a little better value, a little better quality and a little better service than can be obtained elsewhere.

There is just as much satisfaction in selling the best seed as in raising the best cow. There is little chance for permanent profit or pleasure in handling either scrub live-stock or scrub seed.

When the money received for three or four pounds of waste matter, weed seeds or dead grains left in amounts to more than the usual profit on a bushel, there is temptation to lower quality. This worthless bulk often so closely resembles the seed itself that it is scarcely noticeable. Use the test or send samples to your experiment station or to the Department of Agriculture.

Each year an increasing number of Experiment Stations use our seed and we have made a number of shipments to the Department of Agriculture at Washington.

Weeds

THERE is a constant struggle going on among plants for moisture, air, sunlight and the elements of the soil. Without the assistance of the farmer this fight is won by weeds, the plants best able to take care of themselves.

"Above all things freedom from weeds is the most important thing in the purchase of seed. Freedom from weeds must always be the most important field seed quality.

"The farmer who uses care in the selection of seed and employs good agricultural methods, gains in every way, a larger crop, less cultivation, less harvesting expense, a higher price at marketing time."

It is often stated that weeds serve a useful purpose in that they have a value where improper crop rotations are followed, as they save the careless farmer from soil-erosion and add humus. But for all possible benefit rendered they exact blackmail in deterioration of grain, in damage to pasture and even in depreciation of land values.

Even though we can hardly hope to reach the point where fields are entirely delivered from the pest of weeds, we know of farms that are practically free.

Years of hard work have brought an apparent absence of alien growth, but no one knows better than the farmer who has reached this point that he is not free from weed infestation. Particularly is it necessary to watch against sowing them by his own act in carelessly selecting seed.

The statement is sometimes made that it does not pay to sow pure seed for the reason that the ground is already full of weeds. If this is true what good does it do to go long distances for weed-free seed?

It is obviously not good sense to give assistance to the enemy. Then, too, the crop from pure seed of high vitality will do much towards crowding out weeds. In sowing impure seeds there is an even distribution of weed seeds so that a definite proportion will fall on each square foot, thus contaminating the whole field. Clean seeds that have grown to the plumpest maturity are the only seeds that will cover the land with profit-bearing growth. The largest and most profitable crops are always raised by the farmer who exercises the greatest care in selection of seeds.

Weeds are often neglected because the farmer is not acquainted with their power to spread.

Weeds rob the soil of moisture and plant food.

Weeds crowd out the sowed crop.

Weeds increase the cost of every farming effort, plowing, harrowing, seeding, cultivating, cutting, binding, threshing, cleaning, marketing, and then cause the crop to bring less money.

Weeds prosper even when farm crops languish. They either ripen their seeds and get them safely sown before the crop is taken off or they ripen them in time for harvest so that the farmer himself must replant them.

The seeds of many kinds of weeds retain their vitality after being in the ground a long time. Whole pastures apparently free from mustard, dock, foxtail, and other weeds show these to greater or less degree when the ground is brought under cultivation.

Sometimes this results in undeserved blame for the seedsmen.

Usually the weeds that infest fields are introduced with the seed, but often the seed or roots are in the ground because of carelessness in handling previous crops.

That men have always recognized the losses from weeds and the necessity of fighting them, is shown by the following:

"Columella, author of *De Re Rustica*, written in the first century, A. D., says: 'if these (weeding and sarcling—a kind of hoeing) are neglected, the produce of the fields will be greatly diminished; in my opinion he is a very bad farmer who allows weeds to grow along with corn; for the produce will be greatly lessened if weeding is neglected.'"

Seeds containing a considerable amount of some annual weed, such as foxtail are usually less harmful than apparently clean seed that contains a small amount of Canada Thistle, Buckhorn, etc. This is another reason for using the test.

Seed should be procured from fields known to be free from noxious weeds. See page 10, paragraph 6.

In Bulletin No. 48, the Wisconsin Experiment Station says: "Some weeds are so noxious that if farmers knew their real character they would postpone all other business until they were destroyed."

Farm papers are full of inquiries asking how to get rid of weeds. Hardly an issue but contains letters telling of the years

spent fighting patches of Canada Thistle, Crab Grass, Buckhorn, Sorrel, etc.

It is business suicide to sow weedy seed.

Maryland State Bulletin No. 9, says: "The question of pure seed is a very important one in weed control. There is scarcely any agricultural question of more vital importance than the question of good seed; none in which slighter differences can have greater influence on the result; none in which there is greater opportunity for fraud.

"Nearly all our bad weeds have been introduced in seeds of various crops, especially in grass and clover seed. Weeds are being carried every year to new localities in this way. One must be constantly on the lookout, and no seed should be sown without a careful examination for weed seeds.

"Every farmer wants to be sure whether the seed he is planting is the variety or strain he wants and whether it has sufficient vigor to make healthy plants, that is, whether it will germinate properly and whether it carries any infectious disease. *He also wishes to know whether it is adulterated with weeds or other plants not desired.*"

The section of this catalog "How to Know Good Seed," explains how you can avoid being deceived in quality. It also explains just how you may "know whether it is adulterated with weeds or other plants not desired."

Bulletin No. 660 of the United States Department of Agriculture, says: "In a sense farming might be called a warfare against weeds. Some farmers emerge from the struggle victorious, while others go down to defeat. So powerful are weed enemies in reducing crop yields, while at the same time multiplying labor, that the farmer should at every turn strengthen his position against them. He should bear these invaders in mind in planning crops he will grow and in deciding on the fields where he will grow these crops, in choosing the implements he will use, IN BUYING HIS SEED,—far more important than to kill weeds is to avoid having weeds to kill."

The best seed is the first essential of economical production and with the best no time is lost in seeding, no labor wasted in weeding and a maximum crop is realized.

Weedless seeds conserve energy. Weedy seeds waste it. Weedless seeds assure a profit, while weedy seeds make a loss certain.

Scott's Seeds

Carefully Selected, Thoroughly Cleaned

IN A SEED BUSINESS that is built on quality the seedsman's first and most important duty is right selection, for such weeds as Buckhorn, Dodder, Dock, etc., cannot be entirely removed from Red Clover, Mammoth Clover or Alfalfa.

After the most careful cleaning traces of Buckhorn, Sorrel, Canada Thistle and Dodder will be found in Alsike Clover and Timothy, if originally present.

Few weeds can be removed from light seeds such as Blue Grass, Red Top and Orchard Grass.

If mature weeds are in the fields when the crop is harvested for seed, at least a part of them are sure to remain in the crop seed in spite of the most careful cleaning; therefore we must know where to find the different seeds that can be cleaned fit for the users of Scott's Seeds.

Certain conditions of soil and climate favor certain varieties of seed. Sometimes but a very small section will produce the only good seed of a given variety that can be obtained in the United States.

Field seeds must be from regions that are practically free from weeds that cannot be cleaned out. Our aim is to secure our seeds from these localities, and only such seeds as are fully matured and capable of passing on the vigor and heavy growth of the parent crop.

Our seeds give an instant impression of purity and vitality, even to the inexperienced, and this impression is confirmed by the most careful examination. Later the seeds will speak for themselves in larger and better crops.

Scott's Seeds will help you rid your farm of weeds by virtue of two points of excellence. First, they have been carefully selected; second, they have been thoroughly cleaned.

Next to watchfulness in securing freedom from weed seeds and dead grains, doubtless the quality you most want in your seedsman is diligence in rendering service. We are sure that our customers will say that we furnish this without stint. After a seedsman has sold seed of the highest quality the greatest opportunity for service is in seeing that the seed reaches its destination quickly and without loss. We spare no effort to take care of the customer, handling every transaction with a

view to making it hard for the user of Scott's Seeds to place his next order elsewhere.

Some seed is sold with the sole idea of supplying the demand from those who make price the only consideration, with no thought as to quality.

In such cases complaints as to weeds or poor germination are met with the reply, "You bought the seed only because it was cheap. At the price you have no right to complain."

If what we have said about Scott's field seeds in these and other paragraphs is true your only objection to sending us an order can be the question of price.

You want no price penalty attached.

If you realize that the seed you expect to sow will show an actual improvement in production over less carefully selected seed the cost ceases to appear important, for only a few more forks full of hay will pay for the difference in price.

There are several elements of higher price, (not higher cost), that must be considered in the furnishing of the best seed. Constant seeking for the source of supply, careful selection, extra cleaning that removes weed seed and in addition, dead and small grains that are usually left in, loss of weight by the removal of this undesirable matter are some of the things that must be taken into account, Paragraph 7, page 6. A little consideration of these points will make it easy to understand the character of seed that is offered with cheapness as an inducement. If the buyer takes no interest in quality he will pay very dearly indeed. Often the proportion of impurities in a bushel boosts the price of the actual good seed in the bushel to an exorbitant figure, even when the invoice price is far below current prices. (See pages 14 and 15.)

Field seeds, like other commodities, are bought and sold on the basis of market quotations, so there can be little difference in prices wherever purchased, grades being equal. No one seller of seeds can have much advantage over another.

In view of this it would seem that the buyer is sure to get whatever he pays for no matter where he purchases a bushel of clover seed, whether it cost twenty, twenty-five or thirty dollars per bushel. While it can be said of other commodities that you get just what you pay for it is not always the case when buying field seed.

A pound of thirty-cent coffee is worth about thirty cents; fifty-cent coffee is worth about fifty cents.

But when the market price of good clover seed is thirty-five dollars, you get less than thirty dollars in value if you buy thirty-dollar seed. The viable clover seeds in a bushel might be worth thirty dollars if by themselves, but a large part of this value is destroyed by the impurities that are to be found in this kind of bargain. Along with your good seed you are sure to get several pounds of dead grains, and, ninety-nine times out of a hundred, you buy trouble for years to come from WEEDS.

Strenuous competition and wide-spread market information make it impossible for any dealer to sell pure seeds at the price of poor seed.

If prices are low quality must be low.

We claim to have this advantage in quoting prices: We are, so far as we know, the only seedsmen dealing in field seeds alone. This enables us to watch the markets closely and to buy in large quantities at favorable times.

The only way we can cash in on this advantage is to make it to your interest to buy of us.

Scott's Seeds are seldom higher in price than the ordinary run of field seeds and even if they should be a little higher they go much farther.

How to Know Good Seed

WHEN your field shows bare spots,
When the weeds are about as plentiful as the sowed crop,
When plants are small and weakly,

Then you may know that you have sowed the wrong seed.

Perhaps you bought mixed seed or seed at a bargain price or you may have paid the highest price without taking the trouble to have an analysis made. In any case we recommend that you use our test in making your next purchase.

It does make a difference what seed you buy.

Above all things freedom from weeds is the most important.

Each year millions are wasted sowing seeds that look good on casual inspection.

Such an imitation of good seed cannot fool you if you use our test.

It is an indispensable guide; your best guaranty of getting pure seed, and your money's worth.

If you are reaping crops that are not quite satisfactory perhaps it is not your soil, but your seed that you need to know more about.

You fail to get the full results of your labor if you carefully work the ground and then make a mistake in buying seed.

The Department of Agriculture Farmers' Bulletin No. 660, "Weeds; How to Control Them," says:

"First, the farmer *should know what constitutes good seed*: second, he should know fairly closely what high-grade seed is worth; and, third, he should be willing to pay a fair price for it. Laxity on one or more of these points is responsible for most of the farmer's trouble over poor seeds . . . Cheap seeds are really the most expensive kind that can be purchased."

From Department of Agriculture Farmers' Bulletin No. 428, "Testing Farm Seeds in the Home and in the Rural School."

"In the matter of seed-buying *the best protection* to the purchaser is believed to be *self-protection* based on the ability to judge the quality of the seed offered."

We have always recommended careful seed testing. Samples may be sent to Washington for analysis by experts who will identify all the species contained and figure the percentage of each. In addition the number per pound of the more dangerous weeds is computed. Often there is no time to wait for returns from Washington and in such cases the following is a practical method of finding which one of a number of samples is the best.

Spread the sample on a piece of white paper and pick out and scrape to one side all waste matter, that is, weed and foreign seeds, blasted and immature grains, chaff, etc. Then compare the two piles, noting particularly the weed seeds in the waste pile.

This operation puts before the sower a simple basis of comparison between the worth of our seeds and the worth of other field seeds.

You have the prices of different samples. Find their comparative worth, but weed out the weedy lots.

To make a germination test, remix the seed and count out, say, 200 seeds. Be sure to take them just as they come and do not choose the best grains for the object is to find out what percentage of the total seed will grow. The seed may be planted

in a box of dirt or sand kept moist, or may be put between two blotters or strips of cotton flannel, placed on a plate covered with another plate upside down. This prevents evaporation. Keep the blotters moist but not in water and as near the temperature of 70 degrees as possible. Examine the seeds each day and see how they are germinating. Weak or slow germination indicates that the seed will make weak plants. Sprouted seeds may be removed each day if desired. Some seeds require a longer time to germinate than others.

The proper germination periods are as follows:

Clover seed between three and six days.

Timothy and Red Top between five and eight days.

Orchard Grass between six and fourteen days.

Kentucky Blue Grass fourteen to twenty days.

By estimating the percentage of pure seed, (the exact percentage can be found only by using weights), and multiplying this percentage by the percentage that germinates, marking in decimals and dividing the market price by this result you get the approximate cost of one bushel of absolutely pure seed every grain of which will germinate.

Seed costing \$10 per bushel with a purity test of 99½% and a germination test of 94% costs \$10.69 per bushel for perfect seed.

Seed costing \$10 per bushel with a purity test of 99½% and a germination test of 80% on account of dead grains shows an actual cost of \$12.56 per bushel.

Seed costing \$10 per bushel with a purity test of 98% caused by weed seeds and other waste matter and a germination test of 80% shows an actual cost of \$12.75 per bushel. This third lot is about the same as lot two in actual value of perfect seed but is worth many dollars per bushel less on account of weed seeds.

If you want to go into the matter of seed testing a little more thoroughly, send for Farmers' Bulletin No. 428, from which much valuable information can be obtained.

The accepted system of making purity tests seems to be the only practical one, but a person not familiar with it is quite likely to be deceived. You would naturally suppose that 99% pure meant that 99% of the seed would be good, plump, healthy grains. But this is not the case as is shown in the following

letter. We asked about clover seed; the same test is used on other seeds.

Department of Agriculture

Washington, D. C.

O. M. Scott & Sons Co., Marysville, O.

Gentlemen:—Replying to your inquiry of August 15th, I would say that it is the practice of this laboratory to consider all clover seed as pure seeds in clover seed tests whether they are shriveled or not and all parts of seeds larger than one-half as pure seeds. Broken pieces smaller than one-half are considered as inert matter. This is also the practice recommended by the Association of Official Seed Analysts of North America.

Yours very truly, E. BROWN, Botanist in Charge

In making a purity test seed analysts classify impurities as follows:

Inert matter, including broken seeds, dirt, stone, sticks, chaff, and other similar materials.

Foreign seed, including all seeds except those of the kind being examined.

We call particular attention to the fact that no mention is made of dead grains, not even those that are so badly shriveled that any one can tell there is no life in them. It is left to the germination test to show the actual value of the seeds.

Seed may contain 25% or even more of these worthless grains and still test 99% pure.

Above all things, test the seed yourself or have it tested. Do not rely upon a claimed purity test alone, but use our test in judging the amount of dead grains the sample contains.

Remember, however, that blasted grains are not of as much importance in the long run as weed seeds. The very brightest and plumpest seed testing 99½% pure may contain enough weed seeds of a noxious variety to cause one to be sowed on each square foot of the field.

The Farmers' Bulletin last quoted (No. 428) says: "The fact that seed of the principal forage crops in which both the purity and the viability closely approach 100% does appear on the market justifies one in assuming that all seed of these crops sold as high-grade should possess equally good quality."

This is the sort of seed that we are trying to furnish. By testing samples as suggested in the foregoing, you can judge for yourself how we are succeeding.

Not all seed can be sold on a "tell you how to test it" basis. Our seeds are sold in no other way, for we know that the more you know about field seeds, the more anxious you will be to sow Scott's Seeds.

Alfalfa

ALFAFA seed is a much shorter crop this year than we have ever known it to be. Kansas, Idaho, Montana and South Dakota have produced very little. New Mexico, Arizona and California produced a limited amount but this is supposed to be less desirable.

A dry season favors the production of seed but during 1919 there was too little rainfall until harvest time, when October rains ruined much seed that was ready for threshing. The shortage is unfortunate for the high prices are bringing in an immense quantity of European seed of inferior quality. The latter is less hardy and makes a smaller growth than American seed. It is rather difficult to identify but nearly always is of a dark, dead color and much of it contains buckhorn, which is seldom found in the native seed. Be on the lookout for this. It sells for two or three dollars per bushel less but should not be planted at all.

In seeding alfalfa there is one main thing to be considered the same as in sowing any other clovers or grasses — the question of

Weeds

The short crop, (which means a weedy crop), makes it difficult to supply seed that is free from weed seeds, even after thorough cleaning. However, we are starting the season with a large amount of northern grown native alfalfa seed that is practically weedless, and hope to have pure seed all through the season.

We know that some seedsmen do not count freedom from weed seeds of as much importance as locality where grown, but from our own experience and from reports of experiments conducted at various Stations we know that weeds are the most important thing to consider when growing alfalfa. We strongly recommend that you send samples to your Experiment Station for analysis or that you use the test given on page 10.

Even when well along the more aggressive weeds are apt to crowd alfalfa, taking up the space needed to admit sunlight, air and moisture.

In sowing alfalfa it is a question not so much of pounds per acre as of quality of seed and proper soil conditions. Seven pounds of seed that is pure and of strong vitality is better than fifteen pounds that contain weed seed.

The expense of preparing land is the same no matter what kind of seed is sown. The actual difference in the cost per acre between the best and the poorest seed is very little, but the cost of care and of harvesting is greatly increased if weedy seed is sown. It is most unwise to sow weeds with one hand and fight them with the other. Trouble, annoyance and loss are saved by testing seeds. You can not afford to omit investigating the seed you expect to sow.

Do we too strongly emphasize the danger from weeds? We think not.

That the danger of impurities is a real one is proved by analyses of more than 500 samples of alfalfa seed made by the New York Experiment Station. Of 548 samples almost one-fourth contained seeds of dodder, while still larger percentages of the samples showed seeds of buckhorn, yellow foxtail and green foxtail. Considerable percentages contained wild carrot, and Russian thistle, and occasional samples were contaminated with seed of curled dock, crab grass, Canada thistle, chicory, charlock, black mustard and quack grass.

Locality Where Grown

In many cases the importance of locality is exaggerated in order to obtain an extra price for seed which, not infrequently, is unfit to sow.

It has been asserted by growers in South Dakota and Montana that alfalfa from seed grown in those states would more surely withstand winter-killing than from seed grown in Kansas. As this belief has been generally accepted, seed from the northernmost states has commanded an extra price of two or three dollars per bushel. We have not found this preference justified. Careful experiments by many authorities working independently and at Experiment Stations have shown no difference in hardiness.

Through a series of tests conducted by a large number of growers belonging to the State Alfalfa Growers' Association, under the auspices of the Wisconsin Experiment Station, it was found that seed grown in Kansas and Nebraska was in every way equal to and as hardy as seed grown in Montana and South Dakota. The farm tests were identical in results with tests made at the experiment station.

Mr. L. F. Graber, Secretary of the Alfalfa Order of Wisconsin, and connected with the Wisconsin Experiment Station, says:

"The matter of hardiness in alfalfa is not so much a proposition of where the seed is grown or how old the field is, it is more particularly a matter of the strain or variety of alfalfa."

From the standpoint of purity and economy everything is in favor of Kansas seed, as alfalfa reaches the highest point of development in that State. Alfalfa from Kansas seed will recover more quickly after being cut and will have a larger yield than seed produced further north. We suggest that you consult your Experiment Station before paying an extra price for a well-advertised seed that may be full of weeds.

For the reason that Kansas furnishes ideal conditions for the growth of alfalfa and the development of the seed, it is always possible to get seed in that State that is absolutely free from weeds. Having made several buying trips to Kansas we are well acquainted with growers who produce seed of the best quality. In no other State is seed produced that is anything like as pure. In South Dakota growing conditions are not so favorable for seed development and full stands and as a result seed from this section nearly always contains objectionable weed seeds, which can not be removed.

In the first part of this book we have demonstrated many of the losses due to weeds and have shown that inferior seeds thoughtlessly sown may mean the spreading of weeds all over your own and neighboring farms. One of the leading authorities has the following to say on this subject: "Had a few Dakota farmers been alive to the danger when the first Russian thistles appeared in their flax fields, the spread of that most pernicious plant might have been prevented to the great advantage of large areas of the country."

In Montana and Idaho, however, in practically the same latitude as South Dakota we are able to get alfalfa seed that is free from weed seeds, and we always have this to offer at a little higher price than the Kansas seed.

Especially in Idaho we can find seed of excellent quality.

In sections where winter-killing occurs and selection for hardiness seems necessary, we advise that by all means Grimm Alfalfa should be used rather than the purchase at a fancy price of seed of doubtful origin and uncertain worth.

Food Value

Protein is the food value which to a large extent determines the amount of beef or milk a given feed will produce. The market value of any feed is based on the amount of protein it

contains. Nearly all stock feeds fall short of the proportion necessary to proper balance, but alfalfa furnishes this needed element in abundance.

You should not buy protein if you can produce it on your own farm.

Too often on farms where alfalfa is not raised, an unbalanced ration is fed owing to the high cost of concentrated feeds. A large part of the otherwise necessary cash outlay for high protein feeds can be avoided by the use of alfalfa, the most economical ration balancer at the command of dairyman or stockman.

Alfalfa and corn make not only the cheapest but the best balanced ration. To feed corn and other grains alone wastes starch, and animals do not thrive as well as when along with the corn a rich, palatable feed, such as alfalfa, is fed.

The New Jersey Station found, some years ago, that alfalfa produced more than a ton of protein per acre. The actual feeding value at that time was \$74.00 per acre, and under present conditions it is even more valuable. A ton of alfalfa has the feeding value of a ton of bran.

The Idaho Experiment Station publishes the following table:

Alfalfa Hay.....	12.3%	protein
Wheat Bran.....	11.2%	protein
Corn (Shelled).....	7.8%	protein
Clover Hay.....	7.5%	protein
Timothy Hay.....	2.8%	protein

Vermont Bulletin No. 61, says: "It is richer in digestible protein and a better soil and manure pile enricher than is any other plant of economic importance."

Circular No. 25, Michigan Experiment Station, says: "A ton of alfalfa hay contains 46.5 pounds of nitrogen, 12.2 pounds of phosphoric acid and 35.8 pounds of potash and that its total present value, if purchased as commercial fertilizer, would be about \$10.80."

Alfalfa hay can be raised for a lot less than \$10.80 per ton, in fact it can be sometimes purchased for this price. When this is the case one is actually getting the hay for almost nothing because in returning the manure to the fields, only 25.3% of nitrogen, 22.5% of the phosphorus and 12.2% of the potassium is lost.

The sowing of Scott's Seeds will keep the manure pile free from weeds.

What Alfalfa Wants

Seed free from weeds.
Well drained soil.
Sweet soil.
Well prepared seed bed.
Ground free from weeds.
Inoculation.
No pasturing.
Supply the needs and it's as sure as any crop.

What Alfalfa Does

Leads in yield per acre. (Alfalfa, 5.4 tons; Red Clover, 2.5 tons; Timothy, 2.3 tons.)

Leads in feeding value.
Leads as a drought resister.
Leads as a soil enricher.
Leads as a ration balancer.
Furnishes cheapest source of protein.
Takes free nitrogen from the air.
Reduces grain bills.
Increases farm values.

Doubles profits. In a recent survey the Wisconsin College of Agriculture showed that farms growing alfalfa were making nearly twice as much money as those that did not grow it: 377 farms growing alfalfa made a profit of \$1,200.00 per farm; 511 farms with no alfalfa made a profit of \$728.00 per farm.

Preparation of Seed Bed

It is not possible to plow timothy or blue grass sod for immediate planting of alfalfa, without having the growth of alfalfa greatly interfered with by the grass. A cultivated crop, such as corn should be raised the year before; then it is unnecessary to plow the ground unless it is foul or of a very heavy character.

If plowing is thought best it should be done in the fall, especially if early spring seeding is contemplated, for in seeding alfalfa the loose, open seed bed, such as is prepared in plowing a short time before seeding, should be avoided. It takes nearly six weeks for plowed ground to settle for alfalfa seeding. Otherwise, capillarity, or the power of the soil to draw the water to the surface, is interfered with.

The surface should be cultivated until the soil is as fine as a well-prepared garden. This top covering prevents evaporation, and thus keeps the soil warm, besides leaving the seed in complete contact with the soil which makes plant food easily available when the seed sprouts.

The young plants are likely to die in poorly prepared spots, these eventually become weed distributing stations. Hollows become filled with water and ice, which may kill the alfalfa.

Competition of Weeds. Poor Seed

The ground always contains weed seeds, for this reason thorough cultivation at intervals to kill them as they sprout is advisable. After going to this trouble it is surely unwise to sow seed that contains weed seeds that will sprout at the same time as the alfalfa and probably overcome it.

Lack of Fertility

While alfalfa is a deep feeder, drawing its food from greater depths than most plants, it is more tender than other clovers when young, and needs encouragement. Well rotted manure is the best fertilizer, but usually not available. Fresh manure on account of weed seeds should be applied to the preceding crop, or before plowing, the weeds being destroyed by frequent cultivation up to seeding time.

Fertilizers

If it is impossible to use either of the above, commercial fertilizers should be used, especially on poor soils. We like bone meal best. Any fertilizer used should contain a large amount of phosphorus and some potash. Alfalfa gathers its own nitrogen, if inoculated.

Acid Land. Need of Lime

The percentage of lime in the ash of alfalfa is almost 35, nearly twice the percentage shown by red clover, and more than 7 times that in timothy. Lime is beneficial to most plants and to the legumes it is absolutely necessary. More lime is needed for alfalfa than for red clover.

If sorrel, dock, red top, or blackberry bushes thrive in your fields and clover does not, undoubtedly lime is needed. If muriatic acid poured on the soil fails to make bubbles, lime should be used. If limestone pebbles or shells are present lime

need not be added. The absence of these, usually though not always, indicates the absence of lime. Valleys are not so apt to require lime as hills.

When in doubt about lime, use it, or consult your station.

A large crop of alfalfa cannot be expected unless the bacteria which find their home in the nodules on the roots are present. These bacteria gather free nitrogen from the air, and pass it on to the alfalfa, but they have no use for an acid soil.

Of the three forms of lime, the one that is the most economical in your section should be used.

One hundred pounds of raw lime rock when burned is reduced to 56 lbs. of burnt lime or quick lime. When this is water-slaked it takes up 18 lbs. of water, making 74 lbs. of hydrated lime. Therefore 56 lbs. of burnt lime or 74 lbs. of hydrated lime is equivalent to 100 lbs. of ground limestone.

Probably not less than two tons of ground limestone per acre should be applied and more will not hurt. Apply as long before sowing as possible, even a year in advance.

Drainage

All plants require air in contact with the roots. If there is too much water in the soil, the air is reduced, and root development retarded. A lesser top growth follows. Drainage takes off surplus water and admits air, causing circulation. Almost any wet soil, if properly drained, will raise alfalfa. The tile should be put in as deep as may be practicable.

Inoculation

A great many scientists have been giving years of study to the subject of inoculation. As far as we know every one of them agrees that it is necessary to introduce the proper bacteria into the soil if the best stand of alfalfa is expected. The cost for either time or material is small, so it scarcely pays to run the risk of partial or complete failure in order to save the trouble. One method of inoculating is the scattering over the new field of soil taken from an old alfalfa or sweet clover field that is known to be inoculated. Two or three hundred pounds of soil per acre should be used. Sow in the evening or on a cloudy day and harrow in immediately. Another method is the use of commercial cultures. Most of them are thoroughly reliable. The kind we have we guarantee to produce nodules. ~~One advantage they have over soil from an old field is that~~

with the cultures there is no danger of introducing noxious weeds. Nitrogen is the most expensive fertilizing element. If the bacteria are supplied alfalfa fills the soil with it at no cost.

Winter-Killing

Alfalfa seldom winter-kills on land well-drained. Any clover is apt to winter-kill if there is little humus in the soil. Ground containing plenty of humus is porous and ventilated; there are air spaces which favor the rapid carrying-off of excess moisture. Stiff clay soils that are devoid of humus become filled with water which in freezing weather forms ice and causes the soil to expand and heave, pulling out and breaking off the roots. Fields that carry red clover through the winter will do the same for alfalfa. If each year it is becoming harder to keep a stand of clover, put humus in the soil. Soils that contain humus are warmer than soils that do not.

Seeding

Alfalfa may be seeded at any time from early spring until late summer.

Spring seeding of alfalfa, with or without a nurse crop, just as red clover is seeded, is coming into greater favor. Barley or oats is the most desirable grain to plant with the alfalfa. A smaller seeding than when sowed alone is desired. Spring sowing on weedy fields should be avoided for the weeds will quite likely take the alfalfa. Do not clip alfalfa in order to kill weeds until it is in blossom or at least not until the weeds are about ready to seed. This will kill the weeds in young fields. Early mowing may kill the young plants. The idea is to cut as many of the weeds and as little of the alfalfa as possible.

Successful stands are often obtained by drilling the seed in the wheat fields in the early spring.

Sowing in the corn is a good gamble, if care is used to have the field free from weeds and in good order. A one-horse drill may be used, or the seed broadcasted, followed by a small harrow. If one cultivation is omitted, the alfalfa has a better chance on account of the earlier sowing.

Some sow in June, but we have found that foxtail and other weeds are still likely at that time to be a serious menace, and because we don't like weeds, we prefer to sow from July 20th to August 10th. This allows plenty of time for getting the ground in fine shape and for killing the weeds by cultivation.

At this time the young plants receive full benefit of moisture, sunlight and plant food, as they sprout. Late seeding has many advantages on most soils. The land can be used for another crop before being prepared for alfalfa. During the first season the alfalfa plant needs to establish a deep root system to bring up food and moisture in future years. This growth of root depends upon the green leaves and stems above ground. Early clipping when sown alone or when the nurse crop is cut is detrimental because it interferes with the supply of root materials furnished through the leaves. With fall sowing there is little competition from weeds. The second year's production of hay will almost invariably be greater from late summer sowing in spite of the longer time for growing allowed by seeding in the previous spring.

Fertile ground does not require as much seed as poor ground. Poor seed will not go as far as good seed. Broadcasting requires more seed than drilling. Thus the amount required per acre varies, but as a general rule twelve pounds per acre will be found about the right amount. After sowing harrow lightly to cover seed and smooth out any furrows left by the drill, as a heavy rain may bury the young plants. Alfalfa seed should never be covered to a greater depth than one inch. The top soil should be left loose.

Harvesting

Alfalfa leaves contain twice as much protein as the stems, about twenty-eight per cent in the bud stage. This should be kept in mind when the hay is being made, and every means used to save the leaves. Where the leaves shatter in feeding they should be saved. When scalded and mixed with other feed for hogs they make an economical source of protein.

The Kansas Experiment Station found that the protein content of alfalfa when one-tenth in bloom is 18.5%, when in full bloom, 14.4%. For this reason the mature hay is better for horses. But for other stock the green hay, with the larger protein content is the more profitable. Providing new shoots have started the best time to cut is just as the field begins to show blooms. There should be an abundance of shoots about 1½ inches long. If too long they will be clipped by the mower and growing time will be lost, for alfalfa grows from the end of the shoot like a fern. Growing time is lost and a diminished yield results if the crop is cut too soon.

The basal sprouts are the best guide to cutting, but in dry seasons the new shoots are sometimes slow in appearing. In this case the blooms must be taken as the sole guide, for the feeding value diminishes rapidly as leaves are shed to protect the plant from the drought.

In wet seasons the second growth may be six or eight inches high before the blossoms appear. It is better to observe both the sprouts and blossoms before mowing. Crowding alfalfa with too frequent cuttings will weaken the roots for the reason that they will not receive enough food from the stems and leaves; and weeds and grass are not smothered out as effectually, for they will have more air and sunshine. Nothing is gained in the end by cutting a fourth crop.

If the hay is allowed to dry too rapidly this loss of leaves happens during the curing process. A little experience however soon demonstrates that alfalfa is easily cured.

Alfalfa may be put in the stack or mow damper than is generally supposed, that is while the stems are still quite tough or flexible.

Alfalfa should be let lie until the leaves are wilted then raked into windrows and then into cocks, until cured. A heavy crop may be tedded. Alfalfa may be stacked when so dry that moisture cannot be wrung out by twisting the hay.

Usually the greatest growth is from the first crop, which is nearly always harvested during a rainy time and requires more care in handling. Later crops, harvested in mid-summer, may be cut in the morning, raked into windrows in the afternoon and put into the mow the next day.

Any kind of hay should be exposed to the hot sun as little as possible while curing. Too long exposure bleaches the leaves of alfalfa, and causes them to become brittle and fall off. Moreover, if the leaves have been burnt in the sun, they will not absorb the water in the stems and the hay will cure slowly and unevenly. Curing through the action of air and wind is best, therefore, alfalfa should be cured in cocks, instead of in the swath.

The greatest quantity of hay is harvested during the third or fourth season. After this weeds, grass, etc., weaken the stand and the yield decreases.

Pasturing

As a general rule it is best not to pasture alfalfa under any condition although some authorities say that it is safe to pasture when the crop is ready for making hay by turning enough stock on the field to harvest it quickly.

Cultivating Alfalfa

After the first year alfalfa may be cultivated with a spring tooth or special alfalfa harrow, immediately after cutting, when the soil is relatively dry. Grass and weeds, being comparatively shallow rooted are pulled out, but the teeth of the harrow slip around the deep rooted alfalfa plants without injuring them. This method of cultivation eliminates a serious objection to top dressing with manure which is usually full of weed seeds.

Disking is no longer recommended.

Rotation

Alfalfa may be made an invaluable part of the rotation.

Coburn says: "Where alfalfa is allowed to succeed itself year after year, a large proportion of the benefit which might be derived from its power to enrich the soil is lost. Alfalfa has little use for the atmospheric nitrogen which it stores in the soil, nor for the surplus of ash elements which it draws from the subsoil, for it can draw more from the same sources as they are needed. Unless alfalfa is followed by crops that need and can make use of the fertility which it has rendered available, this fertility is in considerable measure wasted. The only method of growing alfalfa so that the most benefit may be derived from it is to make it part of a rotation. A non-leguminous crop following a few seasons' growth of alfalfa will make use of the fertility gathered, to the marked profit of the planter."

Leaves Turning Yellow

The first growth of alfalfa sometimes shows yellow. This may be due to lack either of humus, of drainage, or of lime. Sometimes it is because the young plant is feeding in the surface soil and the condition disappears when the tap root has pushed further down.

Leaf spot is a not uncommon, but not serious disease of alfalfa. Small brown spots appear on both sides of the leaf

which becomes yellow and falls prematurely. Leaf spot is most likely to occur during humid weather, and in the second or third cutting. Clipping invigorates the growth and the trouble usually disappears.

Turkestan Alfalfa. A Warning

This alfalfa is imported from Asiatic Turkestan. It is a dwarf variety and we have known of many instances where fields have had to be plowed up because it was unwittingly sowed.

Under ordinary conditions one-fifth of the alfalfa sowed in this country is imported, 90% coming from Turkestan. Thus there is danger of getting this seed. The market value is about \$2.00 per bushel less than home grown seed.

Turkestan seed is duller in color and a good sized sample usually contains seeds of Russian knapweed which are chalky white in color, wedge shaped and a trifle longer than alfalfa grains. We shall be glad to identify any samples sent to us although this can be more satisfactorily done by the Department of Agriculture. Their Bulletin No. 138 deals with Turkestan Alfalfa seed and is very interesting reading.

Varieties

The name alfalfa is given to any plant of the genus *Medicago* that is used as a forage crop. In general, when used without a qualifying term, alfalfa refers to the species *M. Sativa*. Ordinarily the *M. Sativa*, or purple flowered alfalfa is called common alfalfa to distinguish it from the less familiar varieties. One of the best known of the latter, the Grimm, is classed by some authorities as a member of the *Sativa* species; others, basing their conclusion on the variegated flowers of the Grimm group it with the special *M. Media*. This latter species is thought by many to be the result of a natural crossing of *M. Sativa* and *M. Falcata*. *M. Falcata*, (yellow lucerne or Swedish Clover), has yellow flowers, and sickle-shaped pods; is a native of Northern Europe extending far into Siberia, and is hardier than the *M. Sativa*, though it probably is less productive. The botanists who class Grimm as descending from a cross between *M. Sativa* and *M. Falcata*, explain the superior hardiness of the Grimm as inherited from the *Falcata*.

Grimm Alfalfa

Last season we guaranteed our Grimm Alfalfa not to winter-kill. We did so as a means to obtaining a larger distribution of this desirable variety and to give the purchaser added confidence in our ability to supply the genuine Grimm. At the time this is written we have received no request to make good on this warranty and we expect none, inasmuch as we have sold seed from the same fields for five years now with but two or three complaints of winter-killing.

But Grimm does winter-kill sometimes and as we have but a limited stock, probably not enough nearly to supply the demand, we will not place the guaranty on our Grimm seed this year. Although we know it to be genuine a formal guaranty involves considerable risk and we will wait to see how our trial of this new idea turns out.

Different winter conditions cause alfalfa to kill. A rainy fall prevents the plants from becoming dormant early, making them much more likely to winter-kill than following a dry autumn.

Alternate freezing and thawing in clay or in humus-poor soil will break off the roots. Sheet ice often kills alfalfa.

Grimm has the characters that enable it to withstand these conditions better than any other variety, and at the same time it is thought to be more drought-resistant than ordinary alfalfa. For this reason many believe that on an average Grimm will produce probably more hay than other strains.

Wendelin Grimm, a native of Germany, brought with him to Carver County, Minnesota, a small quantity of alfalfa seed. The seed produced exceptionally hardy plants, and when it was eventually recognized as a superior strain it became known as GRIMM ALFALFA.

As conditions in Minnesota are not favorable for seed production, only occasional limited crops were secured. But the demand grew and as its value became known, sections more favorable to seed development were sought. (See page 10.) Minnesota soil having pioneered the thing, that State acquired national fame as the producer of GRIMM ALFALFA, although as a matter of fact there has been but very little of it ever raised there at all.

Mr. W. A. Wheeler, now with the Department of Agriculture, writing of the hardiness of GRIMM, says:

"I saw a field of it in Saskatchewan, Canada, in 1906, which had withstood the winter when the other stocks under trial were almost entirely killed out. In North Dakota, Minnesota and South Dakota it has always shown its hardiness, never to my knowledge having been excelled in this respect where a good comparison was made. It is a fact that at the Minnesota Experiment Station, the Grimm Alfalfa has to some extent been killed out under most severe conditions. It is well known, however, that there are conditions in the vicinity of the Twin Cities and many other portions of eastern Minnesota which are unfavorable for alfalfa, and these factors are to a large extent responsible for some of the failures in this region. In fact, the Grimm Alfalfa, in its adopted home near Excelsior, Minn., rarely produces seed enough to pay for cutting the crop for this purpose. *** At the Minnesota Station the Grimm Alfalfa seems to be very much the most promising and this is highly recommended. The selection and breeding of alfalfa at this station has been handicapped by the fact that very little, if any, seed is ordinarily produced by the selected plants because of the unfavorable conditions of seed production.

Mr. R. A. Oakley of the Department of Agriculture, in Bulletin No. 757, says:

"When Grimm Alfalfa first began to demand attention, all of the seed was produced in Minnesota, but as conditions there are not favorable for seed production, stock was sent to Montana and other western states in order that the available supply might be more rapidly increased. Carefully conducted tests of Grimm seed produced in Montana, Idaho, and the Dakotas indicate quite definitely that it has not decreased any in hardiness as a result of having been grown for one seed generation under these changed conditions."

These statements place all GRIMM distributors on the same basis. The producing sections are well-known, the market is open, and all handlers are equally well located to furnish GRIMM seed that is true to name. Our extraordinary bid for your preference is in the extreme care we take to furnish seed that is clean and free from weeds.

To furnish carefully selected and thoroughly cleaned seed is the star to which we hitched our wagon at the outset of our business. That we have maintained this ideal year after year has been demonstrated to the enthusiastic satisfaction of several thousand customers, whose orders are entrusted to us annually.

GRIMM will outstand ordinary alfalfa in wet ground, but it cannot be successfully grown on ground poorly drained. All investigators agree that it will do better on hard-pan soil than ordinary alfalfa, and it is the safest seed to sow in any part of the country.

Just why GRIMM ALFALFA is so much hardier than other alfalfa nobody seems to really know. It has never been

satisfactorily settled, but the principal reason generally accepted is its low set crown which affords protection to the tenderest part of the plant. It is also aided by the branching tendency of the roots. It is, however, difficult to distinguish GRIMM from ordinary alfalfa by examining the root system. It does not show so large a percentage of branching roots as one would be led to believe from illustrations of selected plants and from some advertisements. Generally from 40% to 70% of GRIMM roots are branched, but a considerable per cent of the roots of common alfalfa also show this tendency. There isn't a great deal of difference in the blossoms except that Grimm when in full bloom shows a higher percentage of mixed or variegated flowers. The seeds of both are exactly alike. This gives appropriateness to another extract from Bulletin No. 757:

"The supply of seed on the market is still, however, rather limited and commands a high price. As a result, unscrupulous dealers have offered for sale large quantities of common alfalfa under the name of Grimm. Because of this practice, prospective purchasers should take every means possible to learn whether seed is true to name before buying."

GRIMM ALFALFA has a definite market value like any other standard seed. GRIMM at a very low price could not be true to name, and so would be an unwise buy.

We have sold our GRIMM to buyers who had purchased GRIMM elsewhere and found upon examination that it would be unfit to sow because of weeds. Seeds free from weeds is the corner-stone of our whole business.

As the Department of Agriculture and the Minnesota Experiment Station indicate, *it is the inherent characteristics of the strain rather than the locality which first reared it that makes GRIMM ALFALFA HARDY.*

In seed producing sections Grimm Fields are grown for seed almost exclusively, owing to the extra price which the seed brings. The weeds in an alfalfa field tend to increase more rapidly when the stand is allowed to remain for seed each year than when the field is mown regularly for hay. For this reason one should be especially careful in purchasing Grimm Alfalfa.

For five years our seed has been grown in Idaho, where we find seed that is free from weeds. Our Grimm comes each year from the same fields, which by careful attention are kept practically free from weeds.

If you desire a field of genuine Grimm, free of weeds, you will not be disappointed if your seed order is placed in our hands.

Sweet Clover

"SWEET CLOVER a Weed? A valuable weed is not a bad name to apply to Sweet Clover. How often farmers have wished that the crops they try to grow were as hardy and persistent as some weeds. In Sweet Clover we have just that combination, an extremely valuable crop with all the hardness of a boisterous, arrogant weed. It defies drought and wet. It grows on all kinds and conditions of soils, if they are not acid. After surprising, baffling, even disgusting some with its actions, it turns out to be a wonderfully valuable crop. It takes its mineral food from stones and the depths of the subsoil, and reaches into the air for its nitrogen. Finally it leaves the plant food it has gathered in the soil in available form for other less hardy crops." From October, 1918. O. S. U., *Timely Soil Topics*.

With the present difference in price favoring Sweet Clover more of it should be sown than ever before.

No legume is the equal of Sweet Clover for soil improvement, and being a biennial it fits into the rotation just as well as either Red or Mammoth Clover, and is hardier than either.

It seems to be entirely free from the diseases that have so seriously affected Red Clover during the last few years. In some of the best Red Clover seed-producing territory yields of red have been so unsatisfactory that growers are sowing sweet, receiving larger and surer returns per acre.

It is drought resistant, making an excellent growth in dry spells when Red Clover withers and partly dies.

It will grow on any soil, no matter how deficient in plant food or humus, but lime must be supplied if lacking. It thrives where other plants will not grow, as on raw clay soils, on railroad embankments, and around stone quarries.

On poorly drained soils it will do better than alfalfa or red.

On stony and hilly pastures it will improve the soil so that blue grass or other grasses will gradually replace it.

Washed hills and sandy soils are made fertile.

Its extensive root system enables it to gather the little plant food remaining in worn-out and abandoned soils. The abundant root nodules store nitrogen and the decaying roots add humus. The deep penetration of the longer roots improves the drainage and after a crop of Sweet Clover the soil is always more friable and mellow, so that following it a good crop, even of

corn, may be raised, though no profitable crop could be grown before. By plowing Sweet Clover under we have gotten a satisfactory corn crop from raw, waxy clay which had been scraped from a new street.

Observe the uncultivated spots where Sweet Clover appears to grow the best. Organic matter, or humus, seemingly is not necessary, but these spots always contain lime and the ground is always hard. This indicates the method that should be employed in order to be sure of a good stand of this valuable plant. A firm seed bed should be prepared and lime must be applied if the soil is acid. In addition it is well to add phosphorus to ground deficient in this element, and inoculation is almost always necessary, but Sweet Clover being such a rank feeder it is more easily inoculated than alfalfa. Either soil from an old field or commercial cultures may be used.

Sweet Clover prevents erosion on hillsides. Practically never freezes out during winter or spring. It is a weed-killing crop because of its rank growth. It builds up worn-out pastures and meadows. It will carry several times as much stock as ordinary pasture land. It contains more protein than Red Clover. Unlike alfalfa it is not injured by pasturing. Plowing it up is easy, for although the roots are quite large, they are soft and decay rapidly.

Eventually it will be one of the principal crops in live-stock farming.

As a universal plant it leads even alfalfa, for it will grow not only in any climate but on soils where alfalfa fails. Where it is at first impossible to get a stand of alfalfa, Sweet Clover will furnish a profitable yield and at the same time prepare the ground so that there will be no difficulty in establishing alfalfa permanently. If this latter was the extent of its usefulness it would still be a valuable plant, for of course alfalfa has the advantage of being longer-lived and more productive.

Pasture

It is claimed by some that an acre of Sweet Clover will furnish pasture for five or six times as many animals as will the ordinary mixed grasses. While some stock will refuse Sweet Clover at first, they all soon get the habit, especially if turned into the field when the plant is small and tender.

During the first year grazing can start when the plant is about six inches high and can be continued until late in the summer.

One of our friends began pasturing a twelve-acre field of Sweet Clover about two weeks earlier than his neighbors could turn in on ordinary grass. Sixteen cows, nine horses and sixty-three hogs were pastured until July first; after that 119 hogs, 13 cows and 9 horses. The pasture lasted until winter. Not a bit of grain was fed and the cows gained greatly in production of milk. This man expects to plant forty acres of sweet this year.

When seeded on wheat fields during the winter or early spring an abundance of fall pasture is available when most fields are affording very little feed.

The second year Sweet Clover makes a quick, early growth and may be pastured sooner than any other plant. If a seed or hay crop is wanted it can be pastured until the middle of June, for grazing really benefits the stand by causing the plants to stool and make a larger number of branches.

When a field is used for pasture alone enough animals should be grazed to keep it eaten reasonably close. Then there will be a constant supply of small, tender shoots. Should the plants become coarse the pasture can be clipped to stimulate the growth of fresh shoots.

Do not be afraid of pasturing too closely. Usually the more stock you turn on Sweet Clover the better.

If stock are removed about two months before heavy frost the pasture will reseed itself.

Besides furnishing the earliest pasture, it thrives during the hot, dry summer months and makes some growth after the first frosts.

One acre will furnish pasture for at least 20 shoats.

By maintaining two fields of Sweet Clover seeded in alternate years extremely profitable returns are realized from pasturing. The second year's growth of the first seeding is available quite early. When the newly seeded pasture comes on, the stock can be transferred to it and the old field left for hay or for seed, either of which will more than pay the expense of seeding and cultivating the field.

There is less danger of bloat than from alfalfa pasture.

Hay

For four or five weeks after germination, Sweet Clover makes but a slow growth above the ground, but the root system is developing, getting ready to meet unfavorable conditions,

and as is the habit with biennials storing up food not only for this but also for the next season's growth.

The tap roots during the first season will sometimes reach a depth of thirty inches. The top growth is rapid after the plant has once become established.

Cutting First Year's Growth

The first year the crop should be cut for hay at about the time growth ceases. There are two important reasons for cutting at this time. In the first place, this season's growth does not become woody and it is safe to wait until the maximum growth is made. Second and more important, there is no danger of injuring the plants by cutting too close because the first growth of the second year starts from the crown. Shortly before the end of the growing season the crown buds are noticeable, after which it is safe to cut. This point is not generally well understood.

The fact that buds for new growth are all ready to start at the beginning of spring, along with its vigorous root system, makes it produce pasture so much earlier than other plants.

If the plant is clipped early the first year to kill ragweed or other weeds the cutter bar should be set quite high, for after being clipped there is no further growth from the main shoot, but dependence must be had upon the lateral branches for pasturage or for hay. As many of these should be left below the point of cutting as possible. Try to avoid clipping.

Cutting Second Year's Growth

"While the first crop in the second year comes from the crown buds, the new branches which produce the *second crop* of the *second year* come from the buds formed in the axils of the leaves on the lower portions of the stalks which constitute the first crop. These branches usually commence growth when the plants are about 24 inches high. In fields where the stand is heavy and where the lower portions of the plants are densely shaded, these shoots are soon killed from lack of necessary light. The branches which are first to appear and which are first to be killed are those closest to the ground. It is therefore very important when cutting the crop to cut the plants high enough from the ground to leave on the stubble a sufficient number of buds and young branches to produce a second crop.

"In fact, the stand should be cut several inches above the young shoots or buds, as the stubble may die back from one to three inches if the plants are cut during damp or rainy weather."

We quote from U. S. D. A. Farmers' Bulletin, No. 820. This explains very clearly why care should be used in cutting Sweet Clover. We advise the reading of this bulletin as well as Mr. Coe's other Sweet Clover Bulletin, No. 797.

Hay must be made the second year before the bloom buds appear as the plants become woody about this time.

The hay is cured in the same manner as Red Clover or alfalfa, but being more succulent a longer time is required.

As in handling other clovers, the idea is to get rid of the water gradually instead of allowing the leaves and stems to be burnt by the sun. This saves the leaves, the most valuable part of the plant. The hay should lie in the swath until well withered and then be raked into windrows. The next day, if sufficiently dry, it must be put in cocks and cured. The cocks should be of such size that they can be loaded in one fork-full in order that as few leaves as possible be lost.

Seeding

From a labor-saving standpoint, at least, probably the best time to sow Sweet Clover is during the winter any time from January to April on corn ground or other bare ground. Freezing and thawing will bury the seed and cause the hard grains to germinate, there being quite a large percentage of these in any Sweet Clover that has not been scarified.

A firm seed bed is important, so where necessary to plow, if possible the ground should be plowed in the fall and harrowed down, the seed being broadcasted during the winter months. However, seeding may be done in April or May on a well prepared, firm seed bed with just enough loose soil to cover the seed. Like any other clover, Sweet Clover may be seeded on wheat or rye in the spring, or with oats or barley.

August seeding is not desirable in moist sections, for then the plant lasts but one growing season and does not reach its largest development. Many sow during June or July; some as late as the last of August. The Virginia experiment station recommends sowing in August for pasture and hay crops the following year.

While Sweet Clover, once it is established, is very drought-resistant, the plants when young must have an abundance of moisture on account of the deep growing roots.

Too heavy seeding means that young, small branches and leaves on the lower part of the stem will be killed by the crowding. This necessitates higher cutting and makes less and coarser hay.

Inasmuch as Sweet Clover has a hard seed coat, scarifying has proved to be a profitable operation.

It requires ten or fifteen pounds of this seed to the acre; when the unhulled seed is used fifteen or twenty pounds. But the scarified is best for summer or fall sowing for the germination is more rapid. For winter sowing possibly the unscarified, hulled seed is to be preferred. We furnish this or the scarified at the same price.

It should be kept in mind that Sweet Clover will grow on any kind of soil if lime is present. If not, this should be added for it will wonderfully increase the yield. The addition of phosphate where needed is advisable.

Seed Production

When a seed crop is to be saved, Sweet Clover should be first pastured or cut for hay. The stock should be removed from the pasture early enough to assure the maturing of seed; if hay is made, the cutting should be reasonably early, thus assuring a larger number of branches. Of course the mower should be set high, as new shoots will come not from the crown but from the axils of the lower leaves.

A very thin stand produces a surprising quantity of seed when neither clipped nor pastured.

Cutting should be done when about three-fourths of the pods have turned dark, and only when damp from dew or rain as the seeds shatter easily. For this reason when cut with a mower the swath should not be run over.

When cut for hay or pastured the late plants are smaller and are harvested more easily, for the binder can be used. This facilitates handling and makes it possible to use a huller, otherwise it is sometimes necessary first to thresh the coarse straw and then run the seed through the huller. Seed is easily flailed out after being thoroughly cured.

The straw may be used as winter feed or returned to the ground where it has almost as much value as the whole crop.

As a Fertilizer

Sweet Clover roots improve the physical condition of the ground by penetrating below the usual depth of plowing. When they decay, humus is added and the soil has better ventilation and drainage.

If plowing is done year after year at the same depth, a plow sole or hard-pan is developed which keeps the tile from performing their part in drainage. Shallow rooted crops will not penetrate this almost impervious subsoil. Sweet Clover will, and in this way heavy clay and even regular hard-pan soils are made more productive. The fertilizing elements are brought to the surface. The soil is loosened and mellowed and nitrogen is added.

An acre of Sweet Clover has been found to contain nearly thirteen thousand pounds of dry matter, including the roots: as much organic matter as is contained in twenty-five tons of barn manure. A ton of Sweet Clover hay contains twenty pounds of potassium, making it a cheap source of this element. It has the ability to obtain potassium from the most worn-out soils.

While Sweet Clover does best on rich soils there is no other plant that will equal it in building up a run-down farm. This has been demonstrated on the hills of Kentucky where farms had been abandoned on account of the lack of fertility.

Any crop following Sweet Clover will be materially increased; especially is this true of wheat or corn. Some experiment stations show increases of seven bushels per acre of wheat and twenty-two bushels of corn, by plowing under a second year growth of Sweet Clover.

Silage

Sweet Clover is fast gaining favor as a silage crop. It will keep better than silage made from other clovers and the leaves, which are so often lost in harvesting hay, are all saved when the plant is put into the silo. The first crop will produce more than half as much silage as corn. This leaves the second crop for hay or seed.

In Mixtures

A mixture of Rape and Sweet Clover makes excellent hog pasture, seeded at the rate of five pounds of Rape and ten pounds of Sweet Clover. To this may be added a bushel of Soy Beans drilled by themselves.

Renovating Old Pastures

Worn-out pastures are often successfully renovated by disking in the fall and sowing a few pounds of Sweet Clover during the winter. Not only is the amount of pasturage increased by the Sweet Clover, but the grasses will be improved owing to the addition of humus and nitrogen furnished by the Sweet Clover. The same plan may be followed in the spring but not as successfully. The Sweet Clover should be drilled in.

There are a large number of varieties but only two are of value in this country, namely, White Biennial (*Melilotus alba*), and Yellow Biennial (*Melilotus officinalis*).

Beware of *Melilotus Indica*, or Yellow Annual. It was used to some extent last year to adulterate seed "accidentally" mixed in the ware-room. It is absolutely worthless. In California it is a by-product of wheat fields and sells there for two or three cents a pound to be ground into stock feed.

While the white on account of its larger growth is the most popular variety the yellow biennial is preferred by many for both pasture and hay on account of its finer and more branching stems. It seems to be a larger producer of seed. It has the advantage of maturing about two weeks earlier than the white. In four different tests at the Ohio Experiment Station the white produced 10% more hay.

When Sweet Clover is mentioned without any special variety being named it is always understood that the white is meant.

Care should be used in buying Sweet Clover. The seed does not mature evenly and if not well cleaned many dead grains are left in. Hard grains are always present and there is a great deal of danger from weed seeds. We have a scarifier, and take our usual pains in selecting seed that is free from weeds, and in cleaning it.

We have prepared a special chart "Sweet Clover Questions and Answers." We will be glad to send this upon request. It contains in handy form about all the information obtainable on Sweet Clover.

Red Clover

RED CLOVER was first cultivated in Persia. It was carried to Spain and Italy about the 16th century and was soon introduced into Holland. From Holland it was taken to England and about 1770 to Pennsylvania.

Red Clover is often called June or Medium Clover, the latter term to distinguish it from Mammoth.

It has been found that Red Clover has a habit of drawing the crown of the plant into the soil, thus protecting itself from being uprooted by frost in winter.

However, one of the chief objections to Red Clover is the fact that it winter-kills more easily each year. Authorities agree that this increasing tenderness is caused by the continued depletion of humus. Of course, winter-killing may be caused by poor drainage but abundance of humus provides ventilation and helps to prevent water-logging.

Clover sickness is usually due to the absence of available plant food because of the exhaustion of potash and phosphorus from the soil. It is often due to an acid condition. In many instances it will be found advisable to inoculate the seed even though Red Clover has been raised on the field in former years.

If as much care was used in preparing the seed bed for Red Clover as for Alfalfa the yield would be wonderfully increased and winter-killing would be lessened. If possible Red Clover seed sown in the early spring should be drilled or harrowed in or covered in some way. If a fertilizer is used it should be one rich in phosphorus, as most clover soils are deficient in that element, though they usually have plenty of potash. The clover will provide itself with nitrogen from the air.

Farmers' Bulletin No. 260 of the Department of Agriculture says: "First-class Red Clover seed should contain very few weed seeds. This means at most but a few hundred and should mean less than 100 in each pound. Even this seems a large number, but clover seed production has not yet received that special attention which insures perfectly clean seed, and a few hundred weed seeds per pound constitute a small number when compared with the thousands and tens of thousands of weed seeds per pound found in many samples of Red Clover seed."

These sentences should be carefully read and thought over by any one who expects to sow Red Clover for they very clearly outline the results of careless buying.

No one ever writes us that he can buy better clover seed than we are selling but quite often we receive samples of seed that can be purchased at a cheaper price. Many of these we send to the Department of Agriculture for a purity and germination test. Practically all of the large number sent to us each year contain more or less weeds; some of them represent seed that is unfit to sow if it cost nothing at all.

If weed seeds are in Red Clover when sowed it is safe to assume that they will be in the seed crop when harvested, for the progenitors of both probably met each other years before, the weeds seeming to be especially fond of the company of Red Clover.

Every year a large amount of Red Clover is imported from Europe.

"Tests of imported seeds have shown that large quantities of Red Clover seed brought into the United States germinated so poorly as to be of little or no agricultural value."

This is reason enough for always using our test when buying Red Clover seed. Every single pound of this imported seed contained buckhorn, and the department says that it does not produce as much hay as home-grown seed.

This year an unusually large amount of Red Clover is coming in from Italy. Seed from this source is much more to be avoided than foreign alfalfa. According to the Department of Agriculture, besides not growing as rank as native seed, it is much more subject to clover diseases and winter-kills more easily. Even American-grown Red Clover is having a hard time nowadays with various diseases, and it is unwise to increase our troubles by planting a more sickly kind. It is difficult to identify the foreign seed but it invariably contains buckhorn to a greater or less degree and usually a number of other weeds and in practically every case more or less alfalfa. Look out for clover that contains buckhorn, alfalfa seed, and any weeds that you cannot identify as being native. If in doubt send samples to the Department of Agriculture.

Many State Experiment Stations located not too far north are advising fall sowing of Red Clover. This is especially advisable south of the Ohio River.

This season we have seen Red Clover with which annual yellow sweet had been mixed, and other lots with which low-grade crimson clover had been mixed. Both look something like Red Clover, both are worthless to the purchaser, and lower the value of a bushel at least fifty cents for every pound put in. **DON'T BUY IT.**

After sowing Red Clover this spring many are surprised to find the fields full of sweet clover and alfalfa, both very good in their place, but not when bought at much more than their true value as genuine Red Clover.

Some of the weed seeds found in mixed seed should be viewed with the gravest alarm. "One year's seeding, seven years' weeding."

Mammoth

Warranted True to Name

MAMMOTH CLOVER, also called English, Sapling, and Pea Vine Clover, like red, is a biennial, but where soil and climate are particularly favorable, or where prevented from producing seed, it is likely to show a perennial tendency.

As Mammoth Clover matures about three weeks later than red it is better suited for sowing with timothy or red top, red clover being overripe at the proper time for harvesting either timothy or red top.

Mammoth grows to a greater height than red, has larger roots that penetrate to a greater depth, and for this reason will often do well on soils where medium clover will make an unsatisfactory growth, the vigorous growth of the Mammoth enables it to gather more plant food from impoverished soils.

On poor soils Mammoth makes more desirable hay because the growth is not so rank. The long roots enable it to withstand drought and winter-killing better than red. On sandy soil it is superior to red clover which it excels as a green manure crop on account of its large growth of roots and stems.

While the hay is coarser than red clover hay it has the advantage of ripening a month later at the time when there is less danger from rain.

If a seed crop is to be made the clover should be pastured until about June first or clipped, otherwise the plant is likely to exhaust itself in the production of stems and leaves. If the weather is especially dry care must be used in pasturing as the plants may not receive enough growth to produce a large seed crop. On very poor soils it may not be necessary to pasture at all.

Mammoth makes a much surer crop of seed than red. It matures seed about three weeks earlier. Some growers assert that seed is produced just between two broods of clover weevil which often do much damage to red clover.

The very heavy growth usually smothers out most of the weeds and as a result we can always furnish Mammoth that is free from weed seeds. It seldom contains blasted grains.

For the last ten years we have made a specialty of Mammoth for the reason that we have received many letters inquiring for Mammoth from farmers who complained that whenever they had bought Mammoth they had to reap a crop of red. Of course this is provoking and we determined to furnish Mammoth that could be relied upon. We sell an increasing amount of this seed each year.

We know our Mammoth is true to name. In twelve years but two customers have told us that we sent them Red Clover instead of Mammoth.

In order that users of this seed may have confidence that they are getting the genuine Mammoth when they purchase from us we will this season guarantee each lot to be true to name. As stated under Grimm we can not guarantee this or any other seed to grow after it is planted but weather conditions permitting the crop to grow we will gladly replace any seed sold for Mammoth that proves to be Red Clover.

Three years ago we sent one-half dozen different lots of Mammoth to the Department of Agriculture for their experimental grounds. Each lot of our seed proved to be genuine Mammoth; of lots obtained from twelve other sources only 70% grew true to name.

Mammoth this year is much better than Red for it was harvested during a dry time. This is a good year in which to sow Mammoth Clover.

Alsike

ALSIKE seems to have been first cultivated near the village of Sike or Alsike, Sweden, and to have been introduced into England in 1834. It is not known when it was brought to America. On account of its appearance and habit of growth it was once thought to be a hybrid between white and red, but is now supposed to be a distinct species.

While not strictly a perennial it usually remains in the ground for several years. Enough of the heads escape the mower and the grazing of stock to do much toward reseeding. It is not nearly as particular about acid soils as red clover and will withstand winter-killing much better. It should be used in mixtures on any type of soil where the seeding is to remain more than three years, in this respect being preferable to red which dies in two years.

It is particularly adapted to wet soils, sometimes doing well in standing water.

Being free from the diseases that affect red clover, it will grow on most soils even those that raise an indifferent crop of red.

The hay is finer than red clover hay and is preferred by stock but less is produced per acre.

Alsike gathers nitrogen from the air the same as red clover, and would be as valuable in the rotation as a soil builder except for its smaller root and stem growth.

Alsike and timothy ripen together and the alsike does not crowd the timothy as badly as red clover does. For these reasons alsike is preferred for growing along with timothy. Because the alsike does not crowd, it is often sown with red clover. It interferes but little with the growth of the red clover and should the latter fail to grow or be killed the alsike will quite likely take its place. Often alsike, on account of its spreading roots, will keep the red clover from "heaving" out. Much less alsike than red should be used.

Except where grown for seed it is usually best to sow some other seed with alsike, such as timothy, orchard grass, blue grass, or red clover.

A good hay mixture is 3 parts timothy, 2 parts red, and 1 part alsike.

There are approximately 700,000 alsike seeds to a pound, and 250,000 in a pound of red clover, so it takes much less of alsike to sow an acre of ground, probably not more than five pounds.

As the seed is so small it should be lightly covered.

Probably because of acid soil, Canada thistle, sorrel and buckhorn infest many of the sections where alsike is raised for seed, so it is well to look out for these weeds when testing samples. They cannot be entirely removed in cleaning, as many of the weed seeds will be the same size as the alsike. This is especially true of Canada thistle.

Owing to its smaller size alsike is hard to clean, but, by using care in selection, we are always able to furnish seed that is practically weedless.

As alsike goes three times as far as red clover and is considerably cheaper this season, a substantial amount can be saved by mixing it with, or by substituting it for, red.

Quite often we have alsike which contains a little timothy seed that we sell at a special price.

Crimson Clover

CRIMSON CLOVER is said to be a native of Southern Europe. It was introduced into Chester County, Pennsylvania, in 1820, but, until 1880, its distribution was quite limited.

Crimson Clover is a winter annual, that is, being sown in late summer it goes through the winter in a green state and matures its seed and dies in the spring. It will seldom stand the winters north of the 40th parallel. It will grow on almost any type of soil. On stiff clay or sandy soils where red clover refuses to grow it will do well, especially if fertilizer containing phosphoric acid and potash is used to give the young plants a start. Crimson does especially well along the Atlantic Coast from New Jersey to Georgia and has filled the need for a clover suited to southern soils.

Fifteen pounds per acre are usually sowed, the seed being very lightly covered. The seed is sowed according to latitude from August first to October first. Practically all of the Crim-

son Clover sowed in this country is imported from Europe. This means that the seed usually contains the seed of noxious weeds so that a careful examination should be made before buying. (Use our test.) Very often we can furnish home-grown seed.

White Clover

WHITE CLOVER is usually called White Dutch to distinguish it from White Sweet Clover. White Clover is a native of America.

Its chief value is when used for pasture or in lawn or pasture mixtures. It is a perennial making its best growth on rich moist soil but will grow on almost any soil. When sowed in mixtures it will furnish nitrogen for itself and the grasses, besides making a balanced ration. It will stand any amount of trampling. If unmixed, during August when maturing seed, it will cause horses to slobber, owing to the acrid nature of the seed. On account of its creeping root stocks and the abundant production of seed it spreads rapidly. It does not winter-kill and remains green from early spring until late autumn. It withstands drought better than alsike and red clover.

Often seeds of White Clover, which are harder than the seeds of most clovers, will lie in the ground several years until a very wet period, followed by warm weather, causes them to germinate. The result is that we have what is known as a White Clover year.

There is no honey better than that made from White Clover blossoms. There are over 800,000 seeds to the pound.

We often have white clover mixed with alsike as many alsike fields contain a considerable proportion of white clover. This seed can be sold at a much lower price than if white and alsike were bought separately and then mixed.

Japan or Lespedeza

THIS was brought to us from Japan. It was first introduced in South Carolina and is becoming popular in most sections of the South. It is an annual. It has deep roots and will grow on very poor soil, but, unlike Crimson Clover, does not do well on sandy soils.

Vetch

TWO kinds of Vetch are of agricultural importance in this country—Common Vetch (*Vicia Sativa*) and Hairy Vetch (*Vicia Villosa*). The common Vetch is subdivided into spring Vetch and winter Vetch. The Hairy Vetch also is called winter Vetch and is so listed by some seedsmen, but the term “winter” belongs to the common Vetch by priority of use and is probably more widely known in that connection. It is therefore advisable to order the *Villosa* under the designation “hairy” or “sand” Vetch.

Common Vetch is an annual and is rarely grown except in the Pacific Coast States. The spring Vetch will succeed where Canada field peas do, but the latter is the more valuable crop.

Hairy Vetch is a biennial if planted in spring and is much hardier than the common. It will grow in most localities and will succeed on poor land. The name “Sand” Vetch refers to its value as a crop for poor sandy soils. Vetch usually makes a good crop in spite of drought.

Hairy Vetch is very hardy and may be fall sown in all the Northern States. It may be sown in corn at the last cultivation for green manure or hay. It is valuable in the eastern half of the United States where crimson clover cannot be grown.

It is especially well adapted to the sandy soils of Michigan where it is used as a winter cover crop or for seed production.

Hairy Vetch is sown alone or with wheat or rye as a supporting crop. Where the winters are severe the nurse crop is indispensable.

Many sow Hairy Vetch in July but the usual practice is to sow it during the latter part of August or up to the middle of September with Rye. Ten to thirty-five pounds of Vetch is sown with three pecks to 1 bushel of rye. The more hairy vetch sowed the more the soil will be improved.

In some parts of Michigan Hairy Vetch is sown in the spring with Marquis spring wheat for a seed crop. Perhaps this can be done elsewhere.

Hairy Vetch grows rather slowly in the fall, but recovers quickly in the spring and makes an abundant growth which may be plowed under or pastured or cut for hay.

Hairy Vetch may be seeded in the spring for pasture, either by itself or with a nurse crop, such as oats or barley. Some-

times it is mixed with Canada peas and oats. In any case it will furnish excellent summer pasture.

It is almost necessary to inoculate Vetch if the best stand is expected.

Vetch and Rye Mixed

Very often we can supply vetch and rye mixed just as harvested.

Soy Beans

THE Soy Bean is a native of Eastern Asia, coming from China or Southern Japan. In this country it has been an important crop for about twenty years.

Many more Soy Beans were planted last year than ever before and the growing season was so favorable in most sections that we had expected a very large production, but the rains during October completely ruined a large proportion of the ripe beans. We know of one man who lost 1,500 bushels. As the rains were general the crop in most sections has been reduced and we estimate the total to be smaller than last year. This is unfortunate as without doubt the demand will be considerably increased.

For several years we have specialized in Soy Beans. We believe we can supply a greater number of varieties than any other seedsmen. Those we offer have all been tried out in our test plots, and checked with Government and Experiment Station tests as to worth.

As the Soy is a comparatively new plant we are glad to supply any special information that we can.

Clover is so often a failure that it is necessary to find some legume that pays as large returns and at the same time is a sure crop. Soy Beans not only gather more nitrogen from the air than clover but have a larger root system. Thus even though the crop is saved for hay or is pastured instead of being plowed under, the benefit to the ground is as great as from clover as is indicated by the large yields of wheat and corn following a well-inoculated crop of Soy Beans. The Ohio Experiment Station found that wheat yielded 10.3 bushels more to the acre on this sort of ground than on corn ground.

A good hay crop can be realized by planting them after wheat or oats have been removed.

The Soy Bean is used for green manure, hay, forage, grain, and silage.

It is probably the most desirable leguminous catch crop.

The Soy requires from 90 to 150 days to mature. Some of the varieties will mature as far north as Northern New York, but, the plant having originated in a warm climate, many varieties will not ripen except in the South.

It will grow in poor soils and increases the fertility of the land by means of the nodules on its roots. It endures drought, and stands excessive moisture fairly well.

The plant is moderate in its fertilizer requirements. Lime, applied previously to seeding, should be used on acid soils, though liming is not as essential as with other legumes.

Soy Bean hay resembles alfalfa hay very closely in percentage of protein.

Alfalfa Hay.....14.3 Per Cent Protein

Soy Bean Hay.....15.4 Per Cent Protein

As might be expected trials made at experiment stations show that for milk and butter production Soy Bean hay is nearly as good as alfalfa hay. Cattle will leave corn to eat it. It is invaluable to fill in with in case of failure of a clover seeding or of a spring crop.

Milk can be produced by feeding Soy Bean stover at less cost than when corn is used. At the Newark, N. J., Station excellent results were obtained by cooking the stover for growing hogs.

The forage produced by the Soy is higher in protein than any other annual crop of equal yield.

The analysis of meal from Soy Beans shows about 40% protein, which compares favorably with linseed and cottonseed meal. Meal from the Soy Bean has none of the bad effects of cotton seed meal. When mixed with six parts of corn, a bushel of Soy Beans has the feeding value of three bushels of corn, that is, six bushels of corn and one bushel of Soy Beans amount to the same thing as feeding nine bushels of corn.

We can nearly always furnish either ground feed containing about 25% Soy Beans or meal ground from split beans. As the

Soy Bean meal contains 40% protein and 18% fat it is much superior to oil meal.

Experiment stations are urging that Soy Beans take the place of oats in the rotation. By planting corn and beans together, then Soy Beans alone either for hay or grain, followed the next year with wheat and clover, a legume is on the ground continuously. As an average crop of Soys, if inoculated, will store up as much as 125 pounds of nitrogen per acre, it can be seen what they will do for soil improvement when used in this way.

The scarcity of clover seed and the high price of hay makes it imperative that some legume be used that will produce an abundance of hay and forage and at the same time be economical to sow. There is nothing that will fill this want as well as Soy Beans. They not only make more hay to the acre but store up more nitrogen.

Seeding

In seeding Soys the seed bed should be prepared about the same as for corn, cultivating at intervals in order to kill weeds, for, like alfalfa, young Soy Bean plants are easily crowded out by a rank growth of weeds. They may be planted about corn planting time but not until all danger of frost is past and the ground is warm. The seed should be planted not over 1 to 1½ inches deep. If a seed crop is expected they should be planted as early as possible but for hay or green manure they may be planted quite late, even into August, the variety used making some difference. Although solid drilling requires more seed to the acre and in wet seasons there may be some annoyance from weeds, many growers prefer this manner of planting for hay, silage or green manure crops. From 4 to 5 pecks are used. Laboratory experiments in New Jersey point to an increased or intensified use of atmospheric nitrogen where legumes are planted close together. When so planted there is possibly a greater recovery of nitrogen from the air per acre. Thick seeding is probably best for sandy soils. Planting in rows saves seed and permits cultivation.

In weedy ground it is best to plant in rows but Soys drilled solid can be cultivated with a weeder or slant tooth harrow. This should be done during the middle of the day when the beans are dry and tough. Do not cultivate until the beans are three inches high nor after they have reached a height of eight inches.

For seed the beans must be drilled in rows and cultivated. For solid drilling use the oats feed of an ordinary grain drill adjusted to drill, say 75 pounds per acre. A grain drill can be used for drilling in rows by covering up the necessary feed holes. This requires from 15 to 25 pounds of seed according to the size of the beans. The rows should be 28 to 30 inches apart with the beans 2 or 3 inches apart in the rows. When a corn planter is used, some recommend attaching a shoe at the planter runner for regulating the depth.

Cultivation

As the entire bean is pushed out of the ground in sprouting, in case a heavy crust forms, it may be necessary to harrow the ground lightly before the beans sprout, but this should be avoided if possible. Unless weeds are getting the best of the beans they should not be disturbed until three or four inches high, when they are quite tough. When planted in rows the beans can be cultivated until blossoms appear but should not be disturbed after this.

In Corn

When planted with the corn Soys may be "hogged off" or "lambd off," or cut with a binder for putting in the silo. When the former, the lambs or pigs are turned in when the corn is about ready to cut for fodder and the Soys have begun to ripen. Pigs up to 50 or 60 pounds and the lambs will eat the beans without injuring the corn if it is desired to harvest it. If the entire crop is to be pastured, sheep or hogs of any size may be turned in. They take on fat and improve in general condition wonderfully. It is a good plan, if convenient, to feed Soys to the stock a few days before they are put into the field so that they will become accustomed to, and eat the beans readily, otherwise the larger animals will favor the fresh corn. Beans are so rich in protein that it is not necessary to feed tankage or any other protein feed.

For hogging off or for silage the beans are planted right in the rows with the corn. A special attachment can be gotten for the planter that makes it possible to do the whole job at once, or the corn may be drilled first at the regular depth and then the drill filled with the beans, going back over the corn rows, being careful to plant the beans no deeper than one inch. The corn is planted about 18 inches apart and the beans about

6 inches apart in the rows. This requires 6 to 10 pounds of beans. If the planter has a fertilizer attachment the beans may be mixed with the fertilizer or with dust, drilling the mixture as fertilizer. Corn and beans may be mixed together and drilled, but this is not a very satisfactory arrangement.

For hog or lamb pasture, use early Soy Beans and early corn.

Soys should be planted in all corn fields when possible to utilize them, unless the fields are inclined to be very weedy; there is thus no extra expense in cultivating. As they gather nitrogen from the air and the corn gets some of this, the growth of the corn is not lessened and even though it were, the benefit to the ground and the extra forage would more than offset the loss. At least one ton of silage or soiling is added to the field. Many report yields of two tons, a large profit at practically no expense.

Some have found it profitable to broadcast Soy Beans in corn at the last cultivation either for hog pasture or soil improvement.

For Silage

The addition of Soys gives the silage a much greater feeding value as they contain 145% more digestible protein and 40% more fat than the corn silage. Of course Soy Bean silage contains a very much greater amount of protein when the beans are allowed to form in the pods. It should be kept in mind that, like corn, different varieties of beans have different dates of maturity and that the variety to be selected is the one that not only makes a maximum growth of vine but also develops beans by the time the corn is ready for putting in the silo. If the beans are grown in separate fields three loads of corn run through the cutter followed by a load of Soy Beans make a well-balanced feed. They can be used much riper than for hay as they go into the silo without curing and the juices of the corn soften the stems. The harvesting is done with a binder just as the corn alone would be harvested.

The addition of Soy Beans to the silage makes the purchase of oilmeal and tankage unnecessary and greatly increases the flow of milk.

Cornell University in a series of experiments found that non-leguminous plants grown with legumes contained a great deal more protein than when grown alone. As an example

oats grown with field peas contained 7% more protein than oats grown alone; timothy with red clover 44% more. It seems reasonable to suppose that corn grown with Soys should contain more protein than when grown by itself, especially if the Soys are inoculated.

For Hay

Soy Bean hay in curing will stand more unfavorable weather conditions than red clover or alfalfa. The plants should be cut when the pods begin to fill and a few yellow leaves are showing. Well-matured hay may not be so palatable but is more easily cured. When once started the harvesting should be completed in as short time as possible as the leaves fall rapidly when ripe. They may be cut with a mower and left on the ground until wilted; then raked up and placed in tall loose cocks for a week or ten days. An ideal method, however, is the use of the self-binder, setting the small bundles into cocks to cure.

For Seed

The seed cures to best advantage on the stalk so beans should not be cut until absolutely necessary to prevent loss from shattering. A good guide is to wait until most of the leaves have fallen off. If the beans are well ripened it is possible to thresh in a day or two after cutting. If the beans are not allowed to get thoroughly ripe, and some varieties must be cut early or too many beans will be lost, the beans should be kept in cocks until thoroughly cured, otherwise the seed may be damaged when stored in bins or sacks. Cut when dew is on the ground. Some of the large growers of seed cut with a binder just as soon as the top leaves turn yellow, allowing the small bunches to lie three or four days according to the weather and then put in small shocks, reshocking at the end of ten days if the weather is favorable. In four or five weeks the beans are thoroughly cured. This leaves a large amount of leaves on the straw, most of which are lost if the beans are allowed to ripen thoroughly.

Threshing

An ordinary grain separator can be used by removing the regular concave and using a blank or board. The speed must be cut down so as to avoid splitting the beans. Special bean separators can be purchased at reasonable prices. Soy Bean straw is relished more than any other straw by sheep, cattle and horses.

We find that a great many of our customers are using corn shredders for threshing their beans.

Inoculation

There is no question at all but that Soy Beans should be inoculated. They may grow nearly as well without inoculation but will do this at the expense of the soil. When inoculated the roots become filled with large nodules which make them the ideal crop for soil building. There is also little doubt that when they are inoculated the protein content of the plant is greater. For reasons stated before we believe it is especially important to inoculate Soys that are to be planted with corn. In 99 cases out of 100 "no inoculation means no nodules."

Soy Beans in Mixtures

Soy Beans may be mixed with cow peas, sorghum or sudan grass, making a balanced forage; about ten pounds of sudan grass or fifteen pounds of sorghum with three pecks of Soy Beans broadcasted, make hay that is easily taken care of.

Yellows

Ito San

This small yellow bean is one of the best known varieties. It is a heavy seed producer, grows to a height of about 24 inches and matures in about 105 days. Owing to its early maturity it is excellent as a catch crop. A good variety to sow with corn for hogging down. Although rather short it ranks well as a hay producer.

Elton

An early bean that matures just a few days later than the Ito San but makes a larger growth. Good for planting in early corn. It is a large seed producer, and makes early hay and excellent hog pasture.

Manchu

An early variety somewhat larger than the Ito San. Matures in about 110 days.

Hollybrook (Northern)

Matures in 120 days, growing about 36 inches tall. It is a fair producer of seed and hay but is particularly desirable for planting in the corn as it is tall and slender, the lower branches being high enough to miss the binder knives.

Mongol

This bean was formerly called Medium Yellow. It is suitable for silage or hay and is a large seed producer. It matures in 115 days. The plant grows to a height of about 30 inches with medium sized stems and an abundance of foliage, making it an excellent hay variety. It is very much like the Medium Green, is a much heavier yielder and will not shed its leaves so readily nor shatter as badly.

At the Ohio Experiment Station in a four-year test it yielded 25.95 bushels of beans to the acre as compared with 22.71 bushels yielded by the Medium Green.

This bean will be entirely satisfactory in the New England States as an all-purpose bean to substitute for the Medium Green which has always been popular there.

Mikado

This variety grows to a height of about 32 inches, maturing beans in 120 days. It is excellent for grain, hay or silage, but the stalks and branches are somewhat coarse.

Haberlandt

This is one of the most productive varieties. Has large, yellow seeds, grows to a height of 36 to 40 inches and matures in about 125 days. This makes it a little late for ripening seed north of the Ohio River although it is excellent for hay and silage any place.

Mammoth Yellow

This is a late southern grown variety, maturing in about 145 days. It will not ripen beans north of the Ohio River but is grown quite extensively for hay as far north as the New England States. For soil improvement Mammoth Yellows will be found more economical than any other variety on account of the lower price.

Owing to the excellent quality of the seed and the shortage of earlier beans some may find it wise to plant the Mammoth this year for hay or the silo. But for silage we think it especially important to use an earlier variety so that beans will be formed by cutting time.

Medium Yellows

There is some confusion in the names of Soy Beans owing to carelessness and the fact that some growers have given a name of their own choosing to well-known varieties. This is

especially true of the Medium Yellow. It has been called Early Yellow, Mongol, Roosevelt, Hollybrook, etc. We still have some demand for "Medium Yellows" but advise growers to purchase under some other name to be sure of getting what is wanted.

Browns

Early Browns

This is practically the same bean as the Ito San but seems to be hardier. Mr. E. E. Evans, of Michigan, who introduced both, tells us that the Early Brown, besides being somewhat earlier, is a better all-round variety than the Ito San.

Ohio 9035

This bean matures seed in 120 to 125 days. It is one of the best beans developed by the Ohio Experiment Station which probably has done more work with Soy Beans than any other station. It is an erect bushy plant growing to a height of about 30 inches. The leaves are large. For Central Ohio and farther south there is no better variety either for hay or for seed production. Farther north, where a large quantity of hay is desired, it will be found to excel most other varieties. It probably resists shattering better than any other bean, an excellent point in its favor.

Virginia

This is a bean that has lately come into popularity; suitable for both hay or ensilage. The plants are slender with vining terminals, characters which make it one of the best for hay. It matures in about 125 days. The seed is quite scarce.

Blacks

Most of these have fine stems and leaves and are desirable for hay and for silage, but many growers prefer the larger and coarser yellow beans for the latter purpose. As the hogs cannot find the black beans the yellow kinds are more suitable for hogging down. In blacks the same variety often goes under several different names. We have found the Wilson, Sable, Sooty, Jet, Pekin and Arlington to be very much alike. Experiment Station reports vary greatly as to time of maturity and other characters.

Sable

The Sable matures in about 120 days; erect, growing to an average height of about 36 inches. It has a small stem and thin branches which make it desirable for hay. It is probably a heavier yielder of grain than other black varieties.

Wilson

It matures in about 120 days, growing as high as 4 feet. It is inclined to vine more than the Sable and the pods are somewhat higher from the ground. It is very popular but as the seed is always scarce we recommend one of the other black varieties as second choice in ordering.

Pekin, Jet, Sooty

Our test plots show these to be much like the Sable. Most blacks including the Sable seem to be selections from the Pekin.

Ebony

Bushy with fine stem and branches. We have found it earlier and smaller than the other varieties, maturing very little later than the Ito San.

Black Beauty

A bean grown largely in Illinois. The Illinois Station says it is the same thing as the Ebony.

Black Eyebrow

This is an early bean that has become quite popular during the last few years. The seed is usually rather scarce and therefore commands a somewhat higher price than other early beans. Matures in 110 days.

Greens

Medium Green

This was at one time the best known bean but is gradually being discarded as a seed producer for the reason that in unfavorable seasons it suffers more than other varieties and at all times shatters so badly that there is a big loss in seed. The seed is always very scarce and high in price. As a substitute we strongly recommend the Mongol described above.

Morse

Light green or olive. A heavy yielder. Matures in about 115 days, growing to a height of 30 inches. It pods very close to the ground which makes it less desirable for silage but a very good bean for hogging down and for hay.

Mixed Beans

We often have mixed Soys that we can sell at a special price.

Red Clover is sometimes sown in Soy Beans during the latter part of July. If the beans are early and are of a kind that do not shade the ground completely this seems to be a safe operation.

Soy Beans can be successfully grown by anyone and they will surely make any grower a more successful farmer.

Besides storing up nitrogen Soy Beans have a mellowing effect on the soil that puts it in fine condition for the succeeding crop.

They will grow on soil too acid for clovers.

While there is little danger of sowing weeds with Soys there is some danger of planting Soys with a small percentage of germination as they are easily injured in the curing process. There is also likelihood of planting a lot of split beans.

We have the most improved machinery for cleaning them and believe we are furnishing better beans than can be purchased most places.

We give dates of maturity for Ohio. The number of days required for the ripening of beans will vary somewhat with the locality and weather conditions.

In ordering Soy Beans we shall be glad if first and second choice is given. We shall undoubtedly have several varieties not listed here, including the A. K.

Ask for "Soy Bean Questions and Answers."

Canada Field Peas

FIELD PEAS are usually spoken of as Canada Field Peas, the name having been given when the plant was comparatively unknown and the seed mainly imported from Canada. However, few varieties originated in that country.

Being a legume they are soil improvers and furnish a ration rich in protein. They can be sown for soiling and fodder and are unsurpassed for green manure. They are usually sown with oats, about one bushel of each, thoroughly mixed. This combination makes a very desirable hay or soiling crop, the yield being quite large.

Unlike cow peas they should be sown as early as possible in the spring, and do best farther north than Central Ohio.

One bushel of Field Peas, one bushel of Oats, four pounds of Dwarf Essex Rape and eight pounds of Sweet Clover make excellent hog pasture that can be sown in the spring, the pigs being turned in when the oats and peas are about eight inches high.

Field Peas are lower in price this year than most other legumes and so will undoubtedly be in great demand.

Cow Peas

THE Cow Pea, a native of Asia, was introduced into this country over a century and a half ago, and soon came into general use in the Southern States. Here it has remained a successful crop, owing to the fact that frost seldom interfered with its growth of foliage; however, the Cow Pea has gradually found its way into northern latitudes where it has been of high value as a forage crop and a soil improver.

Cow Peas should be sown as soon as the ground is thoroughly warm and dry. When sown with a seed drill, about six pecks of seed should be used. On well drained land Cow Peas will make a fairly good showing, although the plant is best adapted to a rather sandy soil. Harvesting should begin when the first pods show signs of ripening.

Where the land has not grown Cow Peas before, inoculating material should be used, as experiments have proven that it adds much to both crop and the soil.

The most common varieties are the New Era and Whip-poor-will, although the Black, Clay and Michigan Favorite are well-known varieties. For very late planting, the New Era is recommended.

Timothy

THIS grass was first brought to this country from England by Timothy Hanson of Maryland in 1720.

Timothy is distinctly a grass for hay rather than pasture as it does not take kindly to trampling and close grazing. It is our hardiest and best known grass and is a part of all mixtures.

The facts concerning seeding, harvesting, etc., are so well known that it is unnecessary to enumerate them.

Although it is not difficult to procure high-grade seed, it is almost impossible to distinguish blasted and immature grains from viable seed. The careful examination and comparison of samples is therefore a matter of importance.

Often Timothy seed contains a considerable amount of sorrel owing to the fact that both grow on acid soil. It is well to be on the lookout for this as well as for Canada thistle which is not easy to identify in Timothy seed.

In Timothy seed you will nearly always find a small amount of alsike, and quite often grasshopper specks. It is not possible to entirely remove either of these, and while they hurt the looks of the seed they make no difference in the quality, and should not be confused with black plantain which is somewhat triangular and flat.

One peck is the amount usually sown per acre, or if clover is to be sown in the spring—a bushel to six acres. A satisfactory mixture is 7 pounds Timothy, 7 pounds Red and 3 pounds Alsike.

Sometimes we can supply Timothy with a streak of alsike at the same price as pure Timothy. The alsike helps the hay wonderfully.

Timothy and Alsike

TIMOTHY meadows generally contain a certain amount of Alsike Clover and when the seed from such meadows is run through our cleaner it is impossible to separate the Alsike from the Timothy. Especially in clover years large amounts of this seed are brought to us, some lots containing quite a large amount of Alsike. The seed, being mixed, has a less market value than if it were separated, and for this reason we can usually supply Timothy and Alsike mixed at bargain prices.

Timothy grown with a legume will do better than when grown alone.

Timothy and Alsike are alike in many respects. They do well on the same types of soil, ripen at the same time, and are suitable to the same conditions of climate. The sowing of Timothy and Alsike is therefore recommended by experiment stations. There is no doubt that the mixed hay has a much greater feeding value than Timothy alone.

Timothy and Alsike mixtures have become quite popular of late years, but, unfortunately, this has led some people to take advantage of the fact that it is difficult to recognize dead grains and weed seeds in them. Hand-made mixtures composed largely of tailings and inferior seeds are now being offered. We have sent more than one of these mixtures to our experiment station only to have it returned to us with the information that it was tailings and that no purity test could be made.

Timothy that is chock full of plantain and unsaleable at any price can be mixed with low grade Alsike and sold as a good Timothy and Alsike mixture, although the percentage of germination may not be over 10 per cent. This seed will undoubtedly contain a very large percentage of Canada thistle, buckhorn, sorrel and plantain, just such weeds as it is impossible to clean out of Timothy and Alsike. Of course there is no need of sowing this kind of seed, but, for some reason, many farmers are unwilling to take the trouble to have samples analyzed by their experiment stations or even to use the simple test which we suggest.

Pasture Mixtures

A MIXTURE gives a longer period for grazing, furnishes a greater variety, yields a crop richer in protein and makes a better balanced ration than would the grasses composing the mixture if sown separately. But it does not pay to sow in a mixture any grass that will not do well alone. In choosing the grasses to go into the mixture such varieties should be selected that the good qualities of one will balance points in which the other is deficient. For example, the grass that forms roots on the surface is not desirable from the standpoint of fertility; another may send its roots fairly deep but not be as suitable for pasture grass as the other. The two make a combination well adapted to grazing and maintaining the fertility. Pasture Mixture grasses should be selected with respect to their periods of growth so that grazing may be done through the longest possible period.

An example in support of this plan is cited by the Kansas Experiment Station as follows: A combination of Orchard Grass, *Bromus Inermis* and Meadow Fescue is taken. Orchard Grass starts early in the spring, makes a rapid growth and matures early in the summer. Meadow Fescue on the other hand starts late in the spring and matures late in the summer. *Bromus Inermis* is different in character from both of the other two. It starts early in the spring and usually continues to grow throughout the summer. One can readily see that this combination of grasses would be of far more value for pasture than any one of the varieties could possibly be if sown alone.

The Department of Agriculture found that grasses with a strong root system, like Meadow Fescue and Rye Grass, will prevent the winter-killing of other weaker grasses and clover. In a series of tests, the plat giving the best results was the one containing the largest number of grasses. We like to include in our mixtures quite a large number of varieties.

A small amount of various clovers should be included in the Pasture Mixture as legumes not only feed the grasses by pumping plant food from great depths to the surface, but also supply them with nitrogen drawn from the air, and, no doubt, greatly increase the protein content of the grasses. A small amount of alfalfa will do much towards getting the soil inoculated. White clover will grow where nothing else will and

alsike does well in wet places. Due consideration must be given to the fact that the kind of grasses that should be used depend upon the locality. Even in a single field parts will be found that are adapted to grasses that will not thrive in the rest of the field.

In making our mixtures we closely follow the suggestions of the different State Experiment Stations, but, while we have different mixtures for different states, it can be seen that it is wise to tell us the sort of ground for which they are intended.

A pasture should not be merely sowed and left to shift for itself. Beef and milk can not be produced by grazing it without taking from the soil large amounts of plant food. Manure should be used where possible or at least a commercial fertilizer containing a large amount of phosphorus. Outside of the limestone district applications of lime will be beneficial.

A thorough mowing in July or August prevents weeds which the stock have not eaten from stealing moisture from the grass. Mowing prevents weeds from going to seed and by cutting them off at this time many are killed. When pastures are dry it is an excellent plan to harrow thoroughly.

Salting patches of such weeds as quack and wire grass to induce close grazing will often rid the field of these pests.

Those weeds most distasteful to cattle thrive best in meadows. Sow 20 to 25 pounds per acre.

Meadow Mixtures

MEADOW MIXTURES, in contrast with pasture mixtures, should contain only grasses that mature at about the same date.

For reasons already stated it is more profitable to sow a mixture of several grasses, including clovers, for hay rather than to sow one kind alone, for then the roots fully occupy the ground to a considerable depth, each variety getting its food from a different level, the legumes acting as feeders for the grasses.

The quality of seed has a greater influence on the production of hay than has any other factor, for the seeds of most of the grasses are very light in weight and often are injured during

the curing process. High-grade grass seeds, especially those that are free from weeds, are extremely hard to get but by giving the matter special attention, we have in all varieties, seed of high germinating power, the quality being far above the average.

Sow 20 to 25 pounds per acre.

Early Pasture and Soiling Mixture

THE SHORTAGE of labor and the high price of hay will encourage the growth of early or annual pasture mixtures. More energy value from the same acreage can be procured when these are made use of as soiling crops. Canada Field Peas and Oats probably take first rank. Rye and Vetch is well as Japan Millet and Dwarf Essex Rape are also used. Any of these can be added as desired to the following mixtures which we recommend:

No. 1. 8 pecks oats, 4 pecks field peas.

No. 2. 4 pecks oats, 3 pecks barley, 3 pecks rye.

No. 3. 6 pecks oats, 5 pounds sweet clover, 5 pounds alsike clover, 6 pounds timothy.

Kentucky Blue Grass (*Poa Pratensis*)

This variety of grass is native both to Europe and to North America, and, along with two or three other similar species, is the greatest American pasture grass. Authorities are of the opinion that it is grown more or less in every State in the Union. It makes the best sod of any of our grasses and does fairly well on a wide range of soils, although it is better adapted to clay than to sandy loam. It is a very nutritious pasture grass, but has little value for hay. The fact that it is both an early spring and a late fall grower makes it valuable for grazing at both ends of the season. Kentucky Blue Grass constitutes a part of practically every lawn and pasture mixture.

When sown alone, from 30 to 40 pounds per acre should be used.

Owing to the light weight of Blue Grass seed it is difficult to remove weed seeds and the germination is often quite low. There is much old seed on the market, so care must be used in buying as it is extremely difficult to get seed of high purity and

germination. After much trouble we have been able to get a quantity of really high-grade Blue Grass.

Contrary to the opinion generally held, the best Blue Grass seed is produced not in Kentucky, but in Northwestern Missouri. One reason for this is that in Missouri strippers are used that will handle only the ripe seed whereas in Kentucky the business is conducted on such a large scale that contractors begin stripping before the seed has ripened.

Orchard Grass (*Dactylis Glomerata*)

Orchard Grass, known as Cocksfoot in England, is a native of Europe. Its American name is due to the fact that it is successfully grown in partially shaded places.

Orchard Grass will stand more drought than Kentucky blue grass, but is not especially adapted to dry land conditions. It starts very early in the spring and grows rapidly, so that it is valuable in a pasture mixture. Orchard Grass is inclined to grow in tufts or bunches so that it will not permit an even sod. Although of high nutritive value it is not relished by stock as well as blue grass and redtop. It thrives best on rich, well-drained loams and makes a good growth in shady places. Twenty-eight pounds is the amount usually sown per acre.

It is seldom possible to get Orchard Grass that does not contain a considerable amount of dock and sorrel and, quite often, buckhorn, all undesirable weeds.

We have this year some Orchard Grass that is, we believe, a little better than anything we have been able to procure before. It is practically free from weeds.

Redtop (*Agrostis Alba*)

Redtop belongs to a class of grasses that are very widely distributed over the globe. It is a perennial which ranges in growth from a few inches to three or four feet according to the condition of soil and climate. It starts later in the spring than Kentucky Blue Grass, grows slower and matures later. Redtop is valuable for pasture and hay, but does not equal timothy. While adapted to a great variety of soils it does especially well on wet bottoms and should always be included in mixtures for such land.

About 15 pounds of clean Redtop should be sown per acre.

Miscellaneous Grasses

Besides the grasses already mentioned, we are able to offer such varieties as are in general demand: Canada Blue Grass, Meadow Fescue, Tall Meadow Oat Grass, Rye Grass, etc.

Millet

The term Millet takes in a large group of forage plants, the Foxtail being the one most widely known in this country. To the Foxtail group belong the Common, Hungarian, Golden, and Japanese varieties.

Golden Millet

This is the most largely used variety, being grown to a great extent in the West, most of the seed coming from that section. Thirty-five to fifty pounds per acre.

Hungarian Millet

This is smaller and earlier maturing than the Golden. The hay is somewhat more desirable as it is not as coarse. Thirty-five to fifty pounds per acre.

Sudan Grass

This variety of grass was introduced into the United States in 1909 from Khartum, Sudan.

Sudan Grass shows a strong resemblance to Sorghum. It is inclined to grow in bunches, often as many as 200 stems growing from one crown.

It will grow in almost any State in the Union, furnishing an extraordinarily large amount of forage.

When seeded in rows 40 inches apart, about 5 pounds per acre will be found a sufficient amount. From 20 to 25 pounds should be used when sown broadcast.

Dwarf Essex Rape

This valuable plant has been extensively grown in this country during recent years only.

The cost of sowing is very small as only four or five pounds per acre are required.

It grows from 1½ to 4 feet high and makes a large amount of forage for sheep, hogs or cattle.

Most of the Rape used in this country is imported. On account of the small amount of Dwarf Essex being grown at this time, other varieties are offered, many of them of little value, some contain weed seeds.

Corn

IN BULLETIN No. 414, Mr Hartley of the Department of Agriculture says: "The nomenclature of corn varieties is in such chaos, that a varietal name is of little significance compared with the vigor, productiveness and purity of the seed. The Leaming is as constant and well recognized a variety as exists, yet seed ears purchased under this name in Connecticut or New York are, in appearance and productive ability as unlike ears of Leaming purchased in Ohio or Illinois as they are unlike ears of other varieties."

Our aim is to have each variety true to type and unmixed, but as nearly everyone has different ideas as to the ideal ear when selecting his seed corn there is naturally a great variation in the type of varieties bearing the same name.

To produce a corn crop calls for more labor than the raising of any other crop on the farm. The seed corn to plant an acre costs less than the seed of any other standard crop.

Seed corn at five dollars per bushel makes the cost per acre only seventy cents—nothing when compared to the cost of preparing the acre for planting. Yet many farmers who insist upon the very highest quality of field seeds and willingly pay a high price for them, laugh at the idea of any seed corn being worth four to five dollars per bushel.

The best insurance against loss of your labor is being certain that you plant good seed. No one ever produced a good corn crop from poor seed.

A maximum yield can be expected only when there are no weak or missing stalks. To plant a bad ear means about 900 weak, barren or missing stalks to the acre.

The surest and most inexpensive method of increasing production is to plant better seed.

Cultivation, fertility of soil and drainage affect the production of corn but the crop depends first upon the selection of seed.

To quote Mr. Hartley again, "It is possible within a few years to double the average production of corn per acre in the United States and to accomplish it without any increase in work or expense. The lines of improvement which will most easily and quickly accomplish this are, (1) improvement in the quality of seed planted, (2) improvement in the condition of soil, (3) improvement in method of cultivation."

It is necessary to keep down such rank growing weeds as foxtail, cockle, ragweed, etc., as well as the smaller weeds in order to save the moisture and fertility of the soil for the corn, which needs both in abundance.

The New Hampshire Experiment Station in making tests to show the injury of corn due to weeds, raised 17.1 bushels on an uncultivated plot full of weeds. On a plot cultivated shallow five times, the yield was 79.1 bushels and on a plot cultivated deep five times the yield was 69.1 bushels.

Experiments have shown that in almost every case shallow cultivation is preferable to deep. In no case should corn that has reached a height of 2 or 3 feet be cultivated deeper than 4 inches. By the time the corn has reached this height the roots have spread from hill to hill. Probably 2 or 3 inches is deep enough to kill the weeds and at the same time miss the roots.

Cultivation aerates the soil and keeps it warm by preventing the evaporation of moisture.

Experiments have proven that poor care of seed corn has reduced its yielding power 18 bushels per acre without materially injuring its germination.

The germination test answers the question as to whether the corn will grow, but it cannot tell the reproducing value.

The butt grains are fertilized first, and the pollination of the grains proceeds in regular order towards the tip. Owing to this delay in development the tip grains are thought to vary from type more often than the grains on the rest of the ear.

Experiments conducted by the Kansas Experiment Station in the field show that 90% of the middle grains produce plants while only 86% of the butt grains and 70% of the tip grains produce plants.

Thus corn should always be carefully butted and tipped by hand before grading, for no grader will entirely eliminate these undesirable grains. If they are not removed the planter is likely to drop the seed unevenly which will cause a smaller

stand, as a uniform number of grains to the hill or space must be planted if the largest yield is expected.

Drilled corn, on account of the stalks being separated, usually produces a little better than corn planted in hills.

Corn should ripen early enough to escape frost and late enough to make use of all favorable growing weather.

Some farmers grow both a late maturing and an early variety. By following this method they are sure to have some good solid corn, even if early frosts get the late variety.

The smaller early types are now believed to be more favorable for filling the silo than the larger ensilage corns. To give best results silage must have a larger percentage of nutritive value than is found in the immature sappy fodder of southern sorts. The ears should be ripe enough to be well dented and not too soft.

We can ship corn shelled and graded or on the ear, the price being the same in either case.

In describing the different types we have tried to give the exact number of days in which they will mature, as we see no reason for listing a 110-day corn at 85 or 90 or even 100 days. Growing conditions, however, affect the maturity of corn several days either way so it is impossible to tell the exact number of days.

Guaranty

It is manifestly impossible to guarantee corn to grow and make a crop—too many things can happen after it has been planted—but we guarantee our corn to show a high percentage of strong germination in any test that you care to make.

Keep the shipment just as long as you please. If there is anything that you do not like about the corn send it back and we will return your money, paying all transportation charges of course.

Little Clarage

This corn has become very popular in our country. Many of the men who have grown it claim that it will ripen in 85 days, but we have found that enthusiastic growers of early corn are usually about ten days off in their estimates of ripening time.

Ears average from $7\frac{1}{2}$ to 8 inches long and the corn never fails to ripen. The cob is small and the production of shelled

corn will be about equal to that of many of the larger eared kinds. For an extra early corn we know of none that will surpass it.

Improved Clarage

This is a fair sized corn about one inch longer than our Little Clarage and would come under the type called "Improved Clarage." It is a heavy yielder and will ripen in the most unfavorable seasons. It is adapted to either clay or black ground. The fodder is somewhat larger than the Little Clarage or 110-Day White. It makes a solid showy corn and will mature in 110 days or less.

Early Yellow Dent

It is somewhat larger than the Little Clarage and the grains are narrower. It ripens in 110 days or less under normal conditions.

Leaming

This is a yellow dent corn, about nine inches long, with a medium large cob. It matures in about 110 days. Besides being a large yielder, it is valuable for either forage or ensilage, being used quite extensively in the East for the latter purpose.

Little Cob Yellow Dent

This is an early corn with a very small cob. Although a yellow corn every cob is white. The grower who began raising it forty years ago thought he liked white cobs better than red. It is a carefully selected, high-bred corn and as we sometimes find a single ear of Flint in a large field we suppose there was a mixture of Flint in the original selection. This may account for its very small cob and the fact that it matures early and thoroughly. Two years ago it was the only corn in this neighborhood that got ripe enough to show a germination of 90%. We believe there is no variety that will surpass it as a general all-round corn. We recommend it particularly for early ensilage as the stalks contain more leaves than other varieties. It matures in 115 days or less.

Reid's Yellow Dent

This variety resulted from the crossing of an Ohio and Illinois corn. It was originated in 1846 by Robert Reid, who moved to Red Oaks, Illinois, from Ohio. The ears are from 8 to 10 inches long.

This is surely a thoroughbred corn. Cylindrical, the butts and tips well covered, the grains deep and closely set, it is the ideal ear in appearance. It has probably won more prizes than any other corn. The only trouble is that some growers have bred more for looks than utility.

Flint

We can usually supply two or three varieties of Flint corn.

110-Day White (*Commonly called 100-Day White*)

Of this corn we can not speak too highly. The ears average $8\frac{1}{2}$ to 9 inches in length. We could probably best describe it by calling it a white Clarage. The grains are inclined to be broad and they are never chaffy, but hard and firm and of great feeding value. Altogether, it makes the most solid corn of any variety we have ever seen.

It does equally well on either clay or black land. It is especially adapted for hogging-down or for husking from the stalk, because back of this corn are years of selection with the aim of making the ear waist high and the fodder small. In favorable seasons it will mature in less than 110 days, being earlier than most of the so-called 100-Day or Early White corns and superior to them. Those who like a white corn will find that this will meet every requirement.

White Cap

This corn is a cross between yellow and white corn. It has yellow grains with white caps.

It is a popular variety and a big yielder, being strong and hardy. The cobs are both red and white. It matures in 125 days.

Boone County White

Was originally bred at Thornton, Boone County, Indiana. It was a rather large, late growing variety, maturing in not less than 120 days. The grains are long and cream colored. It is excellent for fertile land. It is one of the best late varieties, but hardly safe very far north of the Ohio River.

Ensilage Corn

In Ensilage corn we have Blue Ridge and Clark's Prolific. Both are grown for us in Virginia, as our climate is not suitable for the maturing of such large corns.

U. S. Selections, No. 125 and No. 133

These varieties have been developed by Mr. C. P. Hartley, of the Department of Agriculture.

Selection 133 has been bred from Minnesota 13 and is very early. We believe that this will eventually become one of the leading varieties, especially in the northern section of the country.

Wheat

IT IS a very common thing to see Wheat fields full of mustard, cockle, dock and other weeds. If you could see what we clean out of Wheat you would not wonder at this; but the surprising thing is that anyone will sow Wheat which has not been thoroughly cleaned. By using a little extra care in buying seed, the yield can be increased several bushels per acre.

Our Wheat is just as carefully selected and cleaned as are our clover and grass seeds. We believe it will more than pay for itself by adding to the crop. It contains nothing but large plump berries. The varieties listed below, which have proved the most desirable, are in stock. We are often able to furnish other varieties also.

Wheat should be sown two bushels to the acre as it has been shown through many tests that where this amount is used more profit is realized than where six, seven or nine pecks are sown. There is absolutely nothing in the claim that a peck or half-bushel of certain varieties is enough for an acre.

Poole

This is one of the old standbys. It is beardless, a heavy yielder and stands the winter well.

Portage

This was developed by the Ohio Experiment Station and is a pure line selection from the Poole. It is a good milling Wheat and in stiffness of straw ranks a little below the Poole. It has a smooth head, red chaff and red kernel.

Fultz

Another hardy beardless Wheat that is quite popular in Ohio and neighboring States.

Gladden

This is a pure line selection of Gypsy, developed by the Ohio Experiment Station. It has a very stiff straw, is a large yielder, and as a milling Wheat is above the average. It is bearded, with a white smooth chaff and red kernel.

We find that the demand for Gladden is increasing each year not only in Ohio but in other states.

Nigger

One of the best known bearded varieties which produces an extra hard grain, almost equal to Spring Wheat in this respect.

Spring Wheat

Spring Wheat has become quite popular during the last three years although it did not turn out as well as usual this year on account of the hot weather. In Ohio it should be planted as near the middle of March as possible.

Oats

IN THE United States, Oats are second in importance to Wheat and Corn only. There are many different strains and varieties. We have found those listed below to give excellent satisfaction.

Sixty-Day

Not only is this the earliest Oats, but one of the largest yielders. Owing to its extreme earliness it will make a crop where later varieties will fail. The straw is short and does not lodge, which makes it particularly desirable for a nurse crop. It has great feed value for the reason that the hull is thin and light. One of the best varieties for a soiling crop used in connection with field peas.

Ohio 7009

An Ohio Experiment Station selection of the Sixty-Day.

Siberian

A well-known popular variety and a large yielder. We have Ohio No. 210. An improvement on the original in yield and stiffness of straw.

Big Four

One of the old standbys.

Silver Mine

This is another popular white Oat. It is hardy, with a stiff, bright straw. In this variety we have some fine home-grown seed and expect also to have a car from Montana or Canada.

Scottish Chief

We sold this variety in 1916 for the first time, having brought in a carload from Montana.

We have been selling the Oats raised from this original carload ever since. All reports indicate that the Scottish Chief will out-yield other varieties. They are a trifle earlier than the average Oats and have a stiffer and shorter straw. We cannot recommend this variety too highly.

Oats are usually sown two bushels to the acre.

Rye

EACH YEAR Rye becomes more popular as a cover crop. During the last few years it has been especially profitable for grain. We have the Mammoth White and the Rosen varieties.

Rosen Rye

This pedigreed variety was originated by the Michigan Experiment Station. The berry is larger and plumper than other Rye, the heads long and broad. Another great advantage is the stiffer straw, enabling it to stand up better in heavy wind and rain storms. It showed an average yield of 40 bushels per acre at the Experiment Farm, and will always exceed the yield of ordinary Rye by from 5 to 15 bushels per acre. Sow about one and one-half bushels per acre.

Barley

ONE-EIGHTH of the entire production of Barley is raised in Wisconsin where special efforts have been made to increase the yield by establishing pedigreed varieties. These efforts have borne fruit in the development of a more desirable strain.

Experiments have shown that the Wisconsin Pedigreed Barley outyielded the ordinary Barley by 5 bushels per acre.

We have an extra fine quality of this Barley which we have very carefully re-cleaned.

We remove all small and blasted grains as well as all weed seeds.

Two bushels are sown per acre.

Beardless Barley

All Beardless Barley is more or less mixed with the bearded so we cannot guarantee our seed to be pure. However, we have a rather limited amount of Barley that is much more free from Bearded than the average run and will be found entirely satisfactory either as a nurse or grain crop.

In addition to the grains described here we can furnish Sorghum, Kaffir Corn, Buckwheat, Cow Horn Turnips, etc.

Lawn and Golf Course Seed

Ask for Booklet "Weedless Lawns"

WE GUARANTEE our lawn seed to grow. Owing to its freedom from weeds and dead grains it should go at least 25% farther than other mixtures. We have lawn seed for both ordinary and shady places.

We shall not attempt to go into an extended discussion of lawns and lawn seed here. The matter is too important to crowd into a small space. In our booklet "Weedless Lawns" we believe we have handled the question of making and maintaining lawns a little more carefully than is usually done.

This booklet describes and illustrates the weeds usually found in lawns and tells how to get rid of them, how to keep from sowing them, and how to judge lawn seed, besides giving instructions for the sowing, mowing, watering and general care of the lawn. It applies as well to the maintenance of golf courses.

We will gladly send the booklet on request.

Legume Bacteria

Ask for Bacteria "Questions and Answers"

NITROGEN, which is essential to the growth of all plants and animals, is constantly being removed from the soil. Some of the instrumentalities of its removal are: the growth of grain and other crops, the drainage of the land, and the action of wind and rain. A portion of this loss may be made up by the manure produced on the farm and by commercial nitrogen, but the cost of the latter is too great for profitable use. The only way in which nitrogen can be supplied so that farming may be profitably conducted is to draw upon the unlimited supply in the air.

Only the legumes, clover, beans, peas, etc., are capable of utilizing the nitrogen of the atmosphere. They are rich in protein, requiring more nitrogen than other plants; being heavy nitrogen feeders would be against them if they could not take the nitrogen from the air and use it. The air is made up of several gases, the proportion of nitrogen being 79%.

A legume cannot of itself make use of this nitrogen but the bacteria which live within the nodules on the roots are able directly to utilize the nitrogen of the air. The nitrogen passes into the bacteria and is changed along with other substances that are present into more complex nitrogenous substances which are used in some unknown way by the legume. The legume gives the bacteria a favorable place for development. It supplies the bacteria with sugars and other substances they need and in return the bacteria make the nitrogen of the air available for use of the plant.

The bacteria penetrate the root hairs and rapidly reproduce themselves. After a time the bacteria reach the interior of the root, still reproducing, and pass from one cell to another. The root enlarges and the nodule is formed. A plant can not take nitrogen from the air unless the proper strain of bacteria is already in the soil or is introduced by inoculation.

To show that inoculation pays and performs a real service for the farmer legumes have often been grown experimentally in sterilized soil that is entirely lacking in nitrogen. In these tests the inoculated plants make vigorous growth in spite of the absence of plant food in the soil.

Besides storing up nitrogen for the use of following crops, inoculation in most cases increases the growth of the inoculated legume, besides, making this legume richer in protein. Even though the yield is not increased the plant is without doubt storing up nitrogen for crops that will follow instead of robbing the soil for its own use.

In ordering please specify the kind of legume. The following groups are each inoculated by a different strain of bacteria. Alfalfa and Sweet Clover. Soy Beans. Cow Peas. Field Beans. Peas and Vetches.

The true clovers—Red, Mammoth, Alsike, Crimson, and White Dutch.

We have enough confidence in the bacteria which we supply to guarantee them to produce nodules. We will gladly replace any that do not prove entirely satisfactory.

Inasmuch as it is impossible to say anything like as much as we should about the inoculation of legumes in our limited space, we have prepared some special matter that we will send upon request.

Legal Weight and Quantity per Acre

KIND OF SEED	Pounds Sown Per Acre	Weight Per Bu.
Timothy.....	10 to 15	45 lbs.
Alfalfa (broadcast).....	10 to 15	60 lbs.
Alsike.....	5 to 8	60 lbs.
Red Clover.....	10 to 15	60 lbs.
Crimson Clover.....	10 to 14	60 lbs.
Sweet Clover (hulled).....	12 to 15	60 lbs.
Sweet Clover (unhulled).....	15 to 20	30 lbs.
Redtop Fancy (solid seed).....	14 to 20	14 lbs.
Blue Grass.....	30 to 35	14 lbs.
Orchard Grass.....	25 to 30	14 lbs.
Meadow Fescue.....	20 to 24	24 lbs.
Tall Oat Grass.....	20 to 30	14 lbs.
Lawn Grass Seed.....	60 to 80	
Canada Field Peas (with oats).....	90 to 100	60 lbs.
Cow Peas (broadcast).....	90 to 120	60 lbs.
Cow Peas (drilled).....	50 to 60	60 lbs.
Soy Beans (broadcast).....	60 to 75	60 lbs.
Soy Beans (drilled).....	30 to 40	60 lbs.
Hairy Vetch (with rye).....	10 to 50	
Dwarf Essex Rape.....	4 to 7	50 lbs.
Golden Millet.....	40 to 50	50 lbs.
Hungarian Millet.....	40 to 50	50 lbs.
Japanese Millet.....	15 to 20	32 lbs.
Sorghum.....	70 to 90	50 lbs.
Buckwheat.....	60 to 75	50 lbs.
Oats.....	75 to 90	32 lbs.
Barley.....	90 to 110	48 lbs.
Wheat.....	90 to 110	60 lbs.
Field Corn.....	8 to 10	56 lbs.

Freight and Express Rates from Marysville, Ohio

	Freight Class		Ex. per 100 lbs.		Freight Class		Ex. per 100 lbs.
	3rd	4th			3rd	4th	
Connecticut				New York—Con.			
Hartford.....	66	47	\$1.90	Rochester.....	44	33	\$1.45
Dist. of Columbia				Syracuse.....	48	35	1.53
Washington.....	56	38	1.62	New Hampshire			
Delaware				Concord.....	66	47	2.02
Wilmington.....	57	39	1.69	North Carolina			
Indiana				Raleigh.....	1.01	74	
Auburn.....	36	26	.96	Ohio			
Evansville.....	46	35	1.36	Cambridge.....	31	24	.87
Indianapolis....	36	27	1.08	Celina.....	26	20	.75
South Bend.....	40	30	1.08	Cincinnati.....	31	23	.87
Illinois				Circleville.....	25	19	.75
Chicago.....	44	32	1.15	Cleveland.....	32	24	.87
Danville.....	41	31	1.08	Mansfield.....	26	20	.75
Springfield.....	47	36	1.36	Pomeroy.....	34	26	.87
Iowa				Portsmouth....	35	26	1.15
Des Moines.....	76	52	1.98	Toledo.....	30	22	.75
Kentucky				Zanesville.....	29	21	.96
Hickman.....	52	36	1.65	Pennsylvania			
Lexington.....	40	27	1.08	Clearfield.....	56	38	1.32
Perryville.....	31	16		Meadville.....	46	32	1.08
Williamsburg...	32	17	1.57	Philadelphia....	57	39	1.69
Maine				Pittsburgh.....	40	30	1.15
Portland.....	66	47	2.02	Wellsboro.....	57	38	1.45
Maryland				Wilkesbarre....	67	39	1.62
Baltimore.....	56	38	1.62	Rhode Island			
Massachusetts				Providence....	66	47	1.98
Boston.....	66	47	1.90	Tennessee			
Michigan				Knoxville.....	75	65	1.90
Detroit.....	36	27	.96	Vermont			
Grand Rapids...	44	34	1.08	Montpelier....	66	47	1.90
Jackson.....	36	27	.96	Virginia			
Ludington.....	54	40	1.45	Hampton.....	55	37	1.98
Minnesota				Charlottesville..	55	37	1.62
Minneapolis....	84	61	2.28	Richmond.....	55	37	1.90
St. Paul.....	72	50		West Virginia			
Missouri				Charleston.....	38	30	1.29
Jefferson City... 84	65	1.95		Clarksburg....	42	31	1.15
New York				Harrisville....	38	27	.96
Albany.....	57	40	1.69	Huntington....	35	26	1.15
Buffalo... ..	44	34	1.36	Morgantown....	50	35	1.29
Canton.....	66	47	1.64	Wheeling.....	40	30	.96
Delhi.....	69	49	1.62	Wisconsin			
Elmira.....	49	34	1.45	Madison.....	68	46	1.53
New York.....	60	42	1.78	Milwaukee.....	48	36	1.45

A Few Points About Ordering

Order Early. It always pays. Prices may be no higher, but sometimes it is impossible to get pure seed late in the season.

Order Blank. Use it please. When shipping point is different from your mail address give county under each name. There is space on the back for a few names.

Prepay Stations. If yours is a prepay station be sure to so state on the order blank and send plenty of money for freight charges. We return the difference.

Freight or Express. We always ship by freight unless otherwise specified. However one should keep in mind that express companies give low rates on seed. A small order can sometimes be sent as cheaply by express as by freight. On moderately sized orders we advise express. Marysville is in Union County, Ohio, thirty miles from Columbus on the C. C. C. & St. L. and T. & O. C. Railways. Beans, Peas, and Grains take fourth class freight rates, seeds third class rates.

Parcel Post. Seed may be sent by parcel post according to the following table. In the first, second and third zone the weight limit is 70 pounds; in the others the weight limit is 50 pounds. Where it is as convenient express shipments are better, for many parcel post shipments are lost and it is especially difficult to collect when a shipment is damaged and partially lost.

Zone Rates

Zone	1st lb. or Fraction	Additional lb. or Fraction
1st within 50 miles of Marysville.....	5c.	1c.
2nd within 50 to 150 miles of Marysville.....	5c.	1c.
3rd within 150 to 300 miles of Marysville.....	6c.	2c.
4th within 300 to 600 miles of Marysville.....	7c.	4c.
5th within 600 to 1,000 miles of Marysville...	8c.	6c.
6th within 1,000 to 1,400 miles of Marysville..	9c.	8c.
7th within 1,400 to 1,800 miles of Marysville...	11c.	10c.
8th within 1,800 and over miles of Marysville..	12c.	12c.

Bags. It is not possible to ship three bushels of seed in one bag. It would be better if no bag contained over two bushels of clover seed, it is less likely to be carelessly handled by railroad employees and torn. The express company allows us to ship not over 100 pounds in a bag. We furnish bags at practically cost or less, so you get full value. We prefer to ship in new bags but if you wish send your own bags, being sure to put your name and address on the package and do not neglect to notify us by letter, otherwise they may be overlooked. Please do not put order in package with bags. Send good unpatched cotton bags. Burlaps are not suitable for seed and usually cause losses on grain shipments.

Change of Price. Field seeds, especially those that are thoroughly cleaned, are handled on an exceedingly small margin of profit. Accordingly

they must be sold on the basis of market quotations. This makes it impossible to guarantee prices. Sometimes the market makes a decided change in just a few days. If prices should be lower when you are ready to buy we would hate to lose your order because our prices were higher than a later quotation from someone else. Should they be higher we would have to charge accordingly, so please drop us a line for latest price-list, providing you are not ready to place an order soon after our prices arrive. If in a hurry send along the order. We guarantee that the price will be satisfactory, but please state if we shall deduct seed if there is an advance or add it should there be a decline. **ANY SHIPMENT MAY BE RETURNED IF NOT SATISFACTORY IN EVERY WAY AND WE WILL STAND ALL TRANSPORTATION CHARGES.**

Small Lots. It is necessary to make an extra charge for very small lots but we appreciate receiving these orders just as much as the large ones.

Terms. In every case we must ask cash with order, otherwise the office expense would be such that we could not conduct this business at a profit. All prices are made F. O. B. Marysville.

In addition probably fifty farmers have gotten seed from you that I know of, and in all instances the seed has been satisfactory.

Grover Kinzy, Clayton, Mo., County Agent

Your seed has always given us satisfaction and it gives me pleasure to say so.

O. I. Thomas, Round Hill, Va.

Will you please send me your best prices on the following seeds in lots of 10 to 100 bushels? The seed purchased from you last fall did fine.

J. E. Brame, Chase City, Va., County Agent.

I want the kind of seed you always ship me, free of weed seed.

D. C. Stimple, Aurora, W. Va.

We are in receipt of the seed recently ordered from you and find it the usual high "Scott" quality.

Harry L. James, Elizabeth, W. Va.

I have sowed your seed before with very pleasing results and I am a firm believer in Scott's Seeds.

J. Stanley Dutrow, Charlestown, W. Va.

We note in some of the farm papers that clover seed is going to be scarce and high next spring. We have found your seed to be of such excellent quality, and your treatment has been so satisfactory that my neighbor and I thought we would ask for prices and if your advice was to purchase yet this fall for next spring's use we would do so.

Mentor Hetzger, Moundsville, W. Va.

O. M. SCOTT & SONS CO.

Seed is fine. As good as I ever bought. S. W. Zinn, Philippi, W. Va.

Your seeds are very satisfactory and I have recommended in our Farm Bureau that we patronize you in our collective buying.

C. A. Van Horn, Maple Lane Farm, Blandsville, W. Va.

Please send me your spring price-list for farm seeds. The seeds I purchased from you in the past have been very satisfactory and I have tried to send some of my friends to you.

Frank Wheeler, Mt. Pleasant, Tenn.

Please do not remove my name from your list, am at Washington, for I do not want to lose out in keeping in touch with your seeds. They have proved too good to permit any deficiencies of contact.

Richard E. Dodge, Storrs, Conn.

The soy beans bought from you were very satisfactory and I think we will need quite a good many more this coming season. Will you kindly send me a list of the different varieties you have? We want to put in our order early so as to be sure of getting them.

W. O. Brant, Vinton, Iowa, County Agent.

Please quote me price on 2 bushels Alsike Clover seed and 2 bushels June Clover seed that will grow. I want clean clover seed if possible. It is too much trouble and expensive to sow seed and then pull out the weeds.

A. D. DeGarmo, Highland, Mich.

Thanks for accommodation. That comes the nearest being pure Clover seed I ever saw.

Allen Kelsey, Lakeview, Mich.

Your seeds have been entirely satisfactory to us and we are depending upon your supplying us for the next season.

Richmond Cooperative Ass'n., Richmond, Vt.

The seeds I bought of you last spring were the best I ever got.

John D. Bond, Orange Lake, N. Y.

Your seeds germinate as well as ever, and are free from weed seed.

Wm. H. Ross, Brentwood, Long Island, N. Y.

Received your letter asking about the Grimm Alfalfa we bought from you. I must say it is a fine stand of Alfalfa. Every seed must have come up and no weeds. It came through the winter in fine shape. From the three acres we drew off ten large loads of fine hay from two cuttings. The third cutting will be ready in about two weeks.

Joseph Lemaire, Ulsterville, N. Y.
